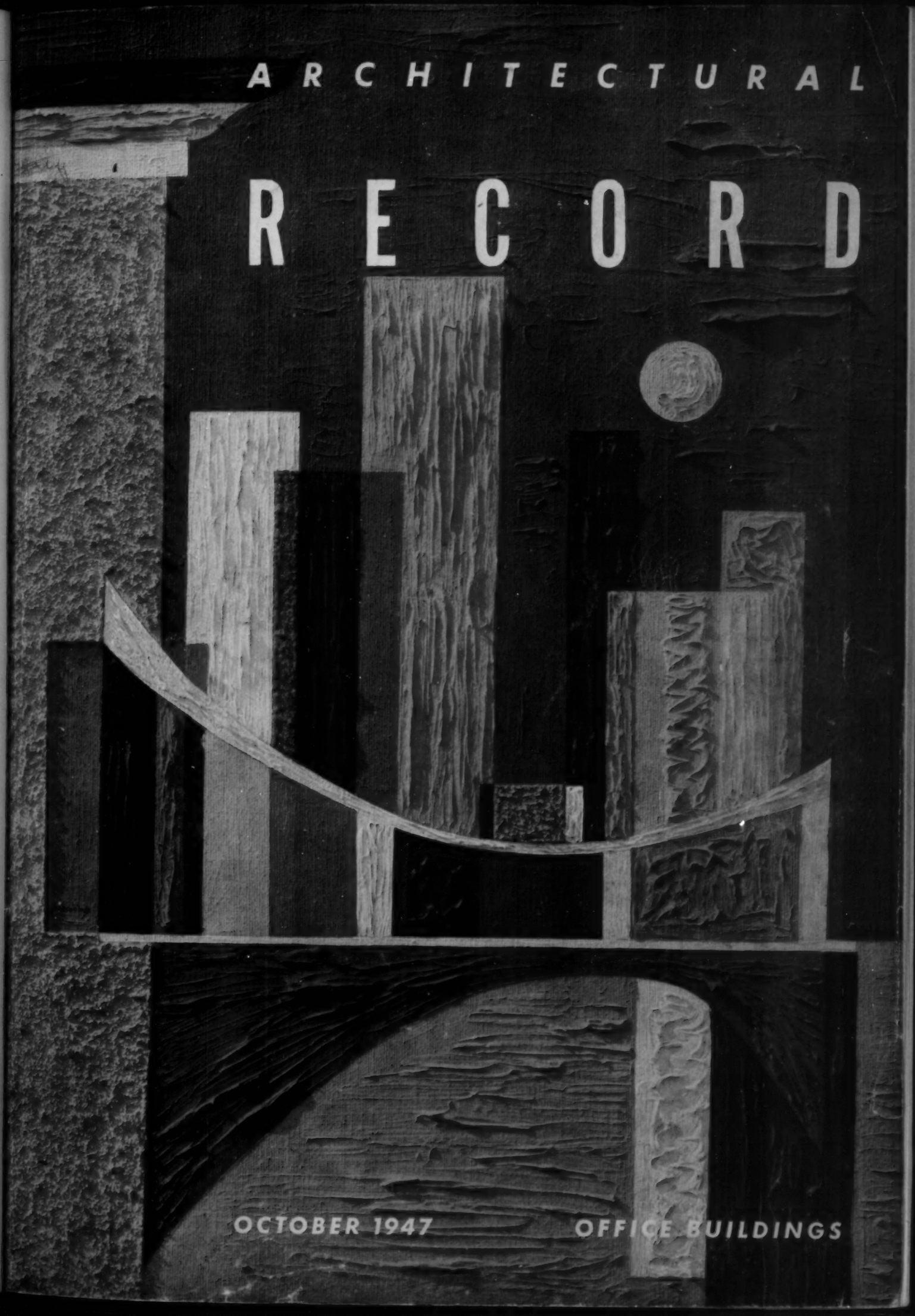
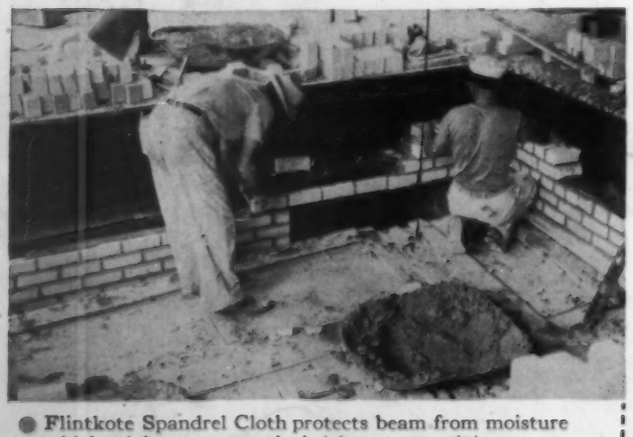

ARCHITECTURAL
RECORD
OCTOBER 1947
OFFICE BUILDINGS

Keep Moisture at Bay... the Flintkote Way

● Flintkote Mastic being applied to the inside surface of cinder-concrete masonry wall. Wall is coated from floor to ceiling.

● Mastic being applied to inside wall along floor and above spandrel beam. Projecting spandrel cloth is then bent up into mastic, and more material is spread over it.



● Flintkote Spandrel Cloth protects beam from moisture which might penetrate the brick or mortar joints.

Don't make any mistake about it. If moisture-protection fails after construction's completed . . . repairs can be painfully expensive.

That's why architects and engineers want to be *sure* when they specify materials. And that's why so many of them specify Flintkote.

Under the Flintkote brand, you'll find a wide line of materials for waterproofing and dampproofing under almost any requirement. Above grade or below . . . inside or out . . . for metal or masonry . . . use of a Flintkote product will give you efficient, economical, *durable* protection against moisture infiltration.

We have a brand new, eight-page folder giving complete specifications and application data on Flintkote Products for Waterproofing and Dampproofing. Mail the coupon today for full information on how to keep moisture at bay, the Flintkote way.

FLINTKOTE PRODUCTS FOR WATERPROOFING AND DAMPPROOFING

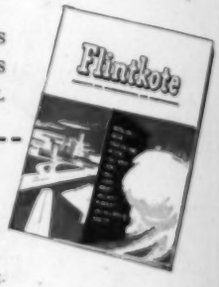
Industrial Asphalt Emulsions • Cutback Asphalt Primers and Coatings • "Hydralt*" Protective Coatings • Asphalt Saturated Membrane • Asphalt Mastics and Semi-Mastics • Asphalt Base Aluminum Paint • Spandrel Cloth

*Reg. U. S. Pat. Off.

FLINTKOTE
INDUSTRIAL PRODUCTS

FLINTKOTE
Products for Industry

ATLANTA • BOSTON • CHICAGO HEIGHTS
DETROIT • LOS ANGELES • NEW ORLEANS
WASHINGTON • TORONTO • MONTREAL



THE FLINTKOTE COMPANY
Industrial Products Division
30 Rockefeller Plaza, New York 20, N.Y.
Gentlemen:
Please send me your new, free folder on Products for Waterproofing and Dampproofing.

NAME .....

ADDRESS .....

CITY .....ZONE.....STATE.....

AR-1047

ARCHITECTURAL RECORD (Vol. 102, No. 4, October, 1947) is published monthly by F. W. Dodge Corp., 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $4.50 per year; Foreign, $6.50.
("Regular" Edition)

Entered as second-class matter at the Post Office, Concord, N. H., under the Act of March 3, 1879.

VOL. 102 • NO. 4 October 1947

ARCHITECTURAL RECORD

F.W.DODGE CORPORATION

Copyright 1947 with all rights reserved F. W. DODGE CORPORATION • Vice-President in charge of Magazine Division, H. Judd Payne • **EDITORS:** Editor-In-Chief, Kenneth Kingsley Stowell, A.I.A.; Managing Editor, Emerson Goble; Senior Associate Editor, Douglas Haskell; Associate Editors, John W. Ragsdale, James S. Graham, Jr.; Associate in South America, Edmund J. Whiting, A.I.A.; News Editor, Florence A. van Wyck • **ART DEPARTMENT:** Myron S. Hall, 3rd, Director; Peter Piening, Consultant; Sigman-Ward, Drafting • **CONSULTANTS:** Industry Relations Consultant, Thomas S. Holden; Statistical Consultant, Clyde Shute; Building Economics Consultant, Norbert Brown; Field Research Consultant, Clifford Dunnels, Jr.

FROM THE COLLEGE TO THE GRAVE 89
An Editorial . . . by Kenneth K. Stowell

ESTABLISHING AN AIRPORT PLANNING PROGRAM 90
By Smith, Hinchman & Grylls, Inc., Architects and Engineers

PRIVATE FIRMS STILL PREDOMINATE IN V.A. HOSPITAL PROGRAM 100

TO GET THE MOST FOR THE LEAST 106
An Experimental House-System Developed by Holden, McLaughlin & Associates, Architects, for American Houses, Inc.

WHERE SIMPLICITY IS THE KEY FOR VARIETY 112
Keith's Home Store, Kansas City. Antonin Raymond, L. L. Rado, Architects

BY, OF, AND FOR ARCHITECTS 118
Club and Office Building in Sao Paulo, Brazil. Forte, Ruchti, Ciampaglia, Architects

BUILDING TYPES STUDY NO. 130 . . . . OFFICE BUILDINGS . . 119

NEW DEPARTURES IN OFFICE BUILDING DESIGN 119
By Lathrop Douglass, Architect

PERHAPS THE BEST IS ACTUALLY THE CHEAPEST 122
By Lathrop Douglass, Architect

PROJECTS

Office Building for Seaboard Finance Company, Los Angeles. Eugene Weston, Jr., Architect 124
Illinois Tool Works Company, Chicago. The Austin Company, Engineers and Builders 128
Office Building for an Industrial Plant. Wurster, Bernardi and Emmons, Architects 133
General Petroleum Building, Los Angeles. Walter Wurdeman and Welton Becket, Architects 134
Insurance Offices. Skidmore, Owings & Merrill, Architects 137
City National Bank Building, Houston, Texas. Alfred C. Finn and Robert J. Cummins, Architects and Engineers 138
Wyoming Valley Veterans' Building, Wilkes-Barre, Pa. Lacey, Atherton, Wilson & Davis, Architects and Engineers 140
Rexall Drug Headquarters, Los Angeles. Albert F. Roller, Architect 142
Loft Building. Charles N. & Selig Whinston, Architects 146

ARCHITECTURAL ENGINEERING . . . Technical News and Research . . 147

BUILT-IN AIR CONDITIONING 147

DESIGNED FOR GERM CONTROL 149
Memorial Laboratory of Infectious Diseases, Bethesda, Md. Designed and Built by Public Buildings Administration

PRODUCTS . . . for Better Building 150

TIME-SAVER STANDARDS 151
Docking Facilities for Motor Transports. By Fruehauf Trailer Company, Detroit 151
Critical Clearance Dimensions of Automobiles. Data Developed by Urban Land Institute, Washington, D. C. 157

MANUFACTURERS' LITERATURE 164

THE RECORD REPORTS . . . News from the Field 7

CONSTRUCTION COST INDEXES 26

REQUIRED READING 28

EMPLOYMENT OPPORTUNITIES 222

INDEX TO ADVERTISEMENTS 240

Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 10 Ferry St., Concord, N. H., with Editorial and Executive Offices at 119 West 40th Street, New York, N. Y. Thomas S. Holden, Pres.; Howard J. Barringer, Vice-Pres. and Treas.; Irving W. Hadsell, Vice-Pres.; Chauncey L. Williams, Vice-Pres.; Sanford D. Stockton, Jr., Secy.; Walter F. De Saix, Asst. Treas.; Edwin H. Freed, Asst. Treas. Member Audit Bureau of Circulation and Associated Business Papers, Inc. Architectural Record is indexed in Reader's Guide, Art Index and Industrial Arts Index. Subscription rates: United States and Possessions, Canada, Cuba, Mexico, Central and South America, and Spain, $4.50 the year, $7.50 for two years, $9 for three years; elsewhere, $6.50 the year, $11.50 for two years, $15 for three years. Single copy, $1. Circulation Manager: Marshall T. Ginn. Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage. Other Dodge Services: Real Estate Record & Builders' Guide, Sweet's Files, Home Owners' Catalogs, Dodge Reports & Dodge Statistical Research Service.

Plumbing Contractors Vote For Adjustable Flush Valves 20-1

Based upon 508 replies from an unbiased survey made among 1,154 of the country's leading plumbing contractors, including those registered at the 1947 N.A.M.P. Convention.

It's the plumbing contractor who actually puts flush valves to work, and who knows first hand the varying operating conditions under which they must serve. Can there be any more convincing endorsement of the adjustable idea than this practically unanimous approval from plumbing contractors?

Architects, too, in a previous survey, reported a similar overwhelming preference for adjustable flush valves. Everywhere the verdict is clear and unmistakable.

For the next job that needs flush valves, keep in mind the well-recognized advantages of the adjustable feature—the feature that makes possible more efficient operation of all fixtures, maximum water savings, and maintained efficiency despite years of service and changing operating conditions. Keep in mind, too, that it was Watrous who pioneered the idea, and that *all* Watrous Flush Valves are adjustable.

THE IMPERIAL BRASS MANUFACTURING COMPANY

1240 W. Harrison Street, Chicago 7, Illinois

For complete information on Watrous Flush Valves see Sweet's Catalog, or write for Catalog No. 448-A. Also ask for Bulletin 477 giving a summary of "Architects' Views on Flush Valve Applications."

A few additional words in your specifications, such as: "All flush valves shall have an external adjustment for length of flush," will bring all the above advantages.

Watrous Adjustable Flush Valves

BOTH DIAPHRAGM AND PISTON TYPES

THE RECORD REPORTS

Anti-Trust Action Starts • NLRB Preparing to Take Jurisdiction in Construction Field • Construction Gains Unseasonal • HHFA Inaugurates Its Activities

Ironically enough, the construction industry, on the heels of a 1947 building upturn, enters October with a double-barreled federal shotgun leveled at its operations. Besides the Joint Congressional housing probe, which draws its first bead this month, the Justice Department is pulling its powerful anti-trust triggers.

The Congressional probers, incidentally, may be handicapped by their intra-committee fuss over the chairmanship. Senator Tobey of New Hampshire lost out last August to Representative Gamble of New York, and Senator McCarthy of Wisconsin became vice chairman. Early plans included hearings for government housing agencies also this month.

Anti-Trust Action Starts

Attorney General Tom Clark got a pre-Labor Day indictment of the National Association of Real Estate Boards and the Washington, D. C., Real Estate Board on charges of fixing commission rates to be charged by realtors. He maintained that these rates had been substantially increased in recent years.

NAREB answered that many businesses and professions issue recommended schedules of fair charges and have done so for generations. "Such norms do not increase costs," said the Association. "They facilitate the doing of business and therefore decrease costs." It pointed to instances in which federal agencies have asked realtors to agree on standardized fees for handling government property. It denied any violation of the anti-trust laws and was given until October 15 to file its plea.

Effect of Justice Department action has been to stir up concern in other quarters — among architects, doctors, lawyers, commission merchants, stock brokers, insurance agents, etc. — as to whether they are liable on similar counts. Some ponder the possibility of legislation to offset the anti-trust threat.

NLRB Tackles Problems

The National Labor Relations Board, which always kept out of the construction field, has been preparing to take jurisdiction. NLRB surveillance of employer-union agreements is expected, so to speak, to backstop the Justice Department's attempt to prove trade restraint. The theory is that the restraints, particularly through boycotts of particular materials or components, are enforced in part by union boycotts. In many cities the unions come to terms, not with the on-site contractor but with his subcontractors who are outlets for specific manufacturers — all employers of A. F. of L. unions. NLRB would proceed under the section of the Taft-Hartley Act that prohibits secondary boycotts aimed at excluding materials from use.

For the NLRB lawyers the great problem is how to go about it. The Agency's machinery is slow; a case often takes months to prepare. This is not lost when permanent jobs are involved; in the case of building the jobs in question often enough will involve a week's work or even the work of a few hours.

But if the Board takes jurisdiction it will have to proceed in the matter. The closed shop is prohibited and union shops must be voted by those on the job. This is all very well for a steel plant but the lawyers wonder how to vote a few bricklayers putting up a single house. They are debating whether they can take only partial jurisdiction.

Employment Up

Economists with their eye on employment comment notably on housing and its role in helping sustain the current high level of jobs. This is one of the few years, they note, in which new housing continued to rise contra-seasonally after the middle of the year. The mid-summer month of July, for instance, kept 1.81 million construction workers busy compared to 1.76 million in June and the 1939 average of 1.15 million. The Bureau of Labor Statistics points out that 80,000 new homes were started in July, shattering records of 20 years' standing and nearing the 1925 peak.

Gains Are Unseasonal

August private construction ran 5 per cent above July, a considerably more than seasonal gain, the Commerce Department reported. Residential construction showed a similar gain. For the first eight months of the year total new construction was running 32 per cent above 1946. Among explanations: builders are getting better deliveries of materials, construction time is being shortened, costs thereby are reduced and sales stimulated, and builders are growing more confident of selling. Too, apartment house construction is upping the overall total.

State breakdowns of new construction show California leading the field by a wide margin, with New York and Texas respectively next in line. Iowa leads in farm construction.

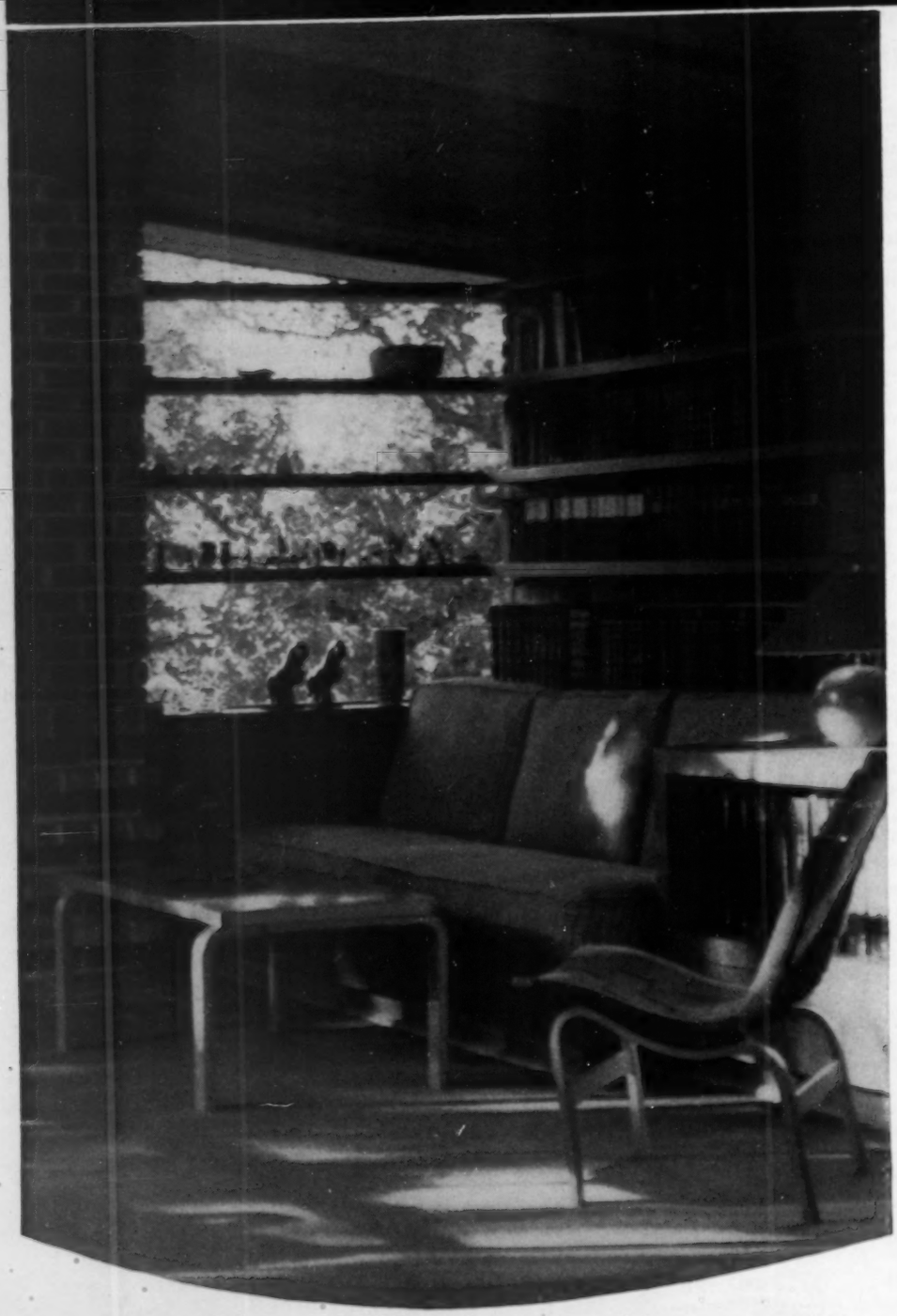
Materials Situation Eased

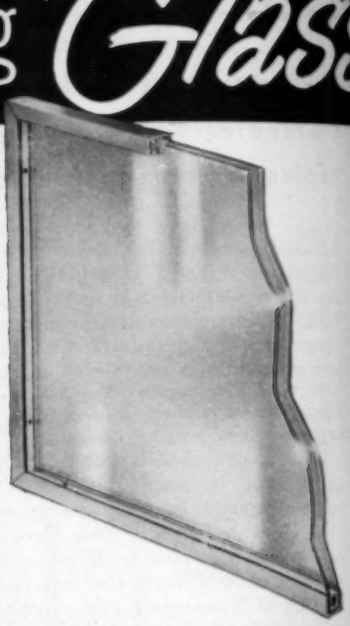
Official reports make clear that most construction materials eased in the first half of the year due to high production levels. Top increases went to hardwood flooring, softwood plywood, clay sewer pipe, cast iron soil pipe, gypsum board, nails, etc. Some of these items, however, remained short in various localities.

(*Continued on page 10*)

— Drawn for the RECORD by Alan Dunn

Suggestions for using *Glass* i





Twindow—"Pittsburgh's" new window with built-in insulation—when made with 2 panes of glass has nearly twice the insulating efficiency of ordinary windows. It has even greater insulating efficiency when made with additional panes. It cuts heating and air-conditioning costs . . . facilitates proper temperature maintainance.

Many attractive and practical bathrooms and kitchens have been designed with walls or wainscots of Carrara Structural Glass. This reflective polished glass is impervious to moisture and chemicals and is very easy to clean. The bath above has Carrara shelves and a large built-in mirror, as well as Carrara walls. Carrara is available in 10 smart colors. Architects: Walter T. Karcher & Livingston Smith.

The complete line of "Pittsburgh" glasses includes a quality glazing material for every conceivable need. Pittsburgh Polished Plate Glass has been famous for almost 70 years for its clarity, polished beauty, and absolute transparency. Pennvernon Window Glass is eminently satisfactory to meet all sheet glass requirements. And where *insulated* transparent windows are desired, Twindow, the window with built-in insulation, is unexcelled. Architects: W. A. Ganster & A. Hennighausen.

PITTSBURGH PLATE GLASS COMPAN

in residential buildings

Pittsburgh Mirrors can be used in countless ways to enhance the attractiveness of any interior. A large, structural mirror over the dining room buffet, as shown here, is one of the most popular applications. Other attractive and practical uses of mirrors: over the mantel; on bedroom and dressing room doors; on the back walls of the tub recess in the bathroom. Made from blue, flesh-tinted or green Plate Glass, polished Plate Glass and with silver, gold or gunmetal backing.

PC Glass Blocks offer numerous interesting possibilities in residences of both traditional and modern architecture—above work surfaces in kitchens . . . around front entrances . . . in stairwell walls, and for semi-partitions as shown here. These blocks transmit daylight generously yet provide privacy. They make rooms brighter, smarter, more cheerful. Their insulating properties cut heating costs.

We believe you will find much to interest you in our illustrated booklet of ideas concerning the use of Pittsburgh Glass in building design. Send the coupon for your free copy.

Pittsburgh Plate Glass Company
2295-7 Grant Building, Pittsburgh 19, Pa.

Please send me, without obligation, your free booklet entitled "Ideas for the Use of Pittsburgh Glass in Building Design."

Name.....

Address.....

City..... State.....

★ Design it better with

Pittsburgh Glass

"PITTSBURGH" stands for Quality Glass and Paint

PITTSBURGH PLATE GLASS COMPANY

 (*Continued from page 7*)

Sheet steel continued very short and is expected to remain so.

Lumber production rose and high demand was anticipated the rest of the year, although the freight car shortage was handicapping some areas. Gradual change toward a buyers' market and a leveling off and stabilizing of prices were noted, particularly for lower grades of lumber.

HHFA Gets Going

Meanwhile the new Housing and Home Finance Agency, with Raymond M. Foley at its head, proceeds on organization and policy problems. The National Housing Council, as part of HHFA, began its work of coordinating federal activities in this field; members outside HHFA units include representatives of the Agriculture Department, Veterans Administration, and the RFC.

In the FHA Commissioner Franklin D. Richards has named Walter L. Greene as first assistant commissioner, Maurice R. Massey as assistant commissioner in charge of field operations, and Herbert C. Redman as commissioner for northeastern U.S.

FHA, incidentally, has expanded its insurance coverage to new small homes of the $3000 to $3500 class. Under revised regulations responsibility for sound construction and suitable location rests with the lending institution and the builder. Maximum loan is $3000 secured by a first mortgage with a 20-year maturity.

In the rental field FHA has insured the mortgage for the Meadowbrook Apartments in Indianapolis, largest single project for rental housing for World War II veterans. The project comprises 640 new dwelling units; the mortgage amounts to $4,792,500. Other large projects insured include Stuyvesant Manor, Irvington, N. J. (579 units); Glen Oaks Village, New York City (576 units); Burrion Heights, Seattle (544 units); and University of Miami (533 units).

Loan Activity

From the Home Loan Bank Board — its members are J. Alston Adams, Nathaniel Dyke, Jr., and John H. Fahey — come the following significant data:

1. While non-farm real estate financing (first half of 1947) ran 11 per cent above last year, this results mainly from larger loans. The upward curve of financing is flattening out.

2. Savings of the public invested in insured savings and loan associations rose in the first half of 1947 well above similar investments in 1946 and 1945. Nearly 97 per cent of depression-period investments of the government in share capital of these associations has been paid back. (The government, by the way, earned nearly $55 million in dividends on an investment of $273 million.)

Airport Program

A revised federal-aid airport program has been drawn up by the Civil Aeronautics Administration calling for the construction or improvement of 908 airports at an estimated federal cost of $66.5 million and local cost of $70.2 million. (CAA has on file a backlog of $250 million in additional requests for aid). Of the total $35.2 million is for Class 3 or smaller airports and $31.2 million is for Class 4 and larger.

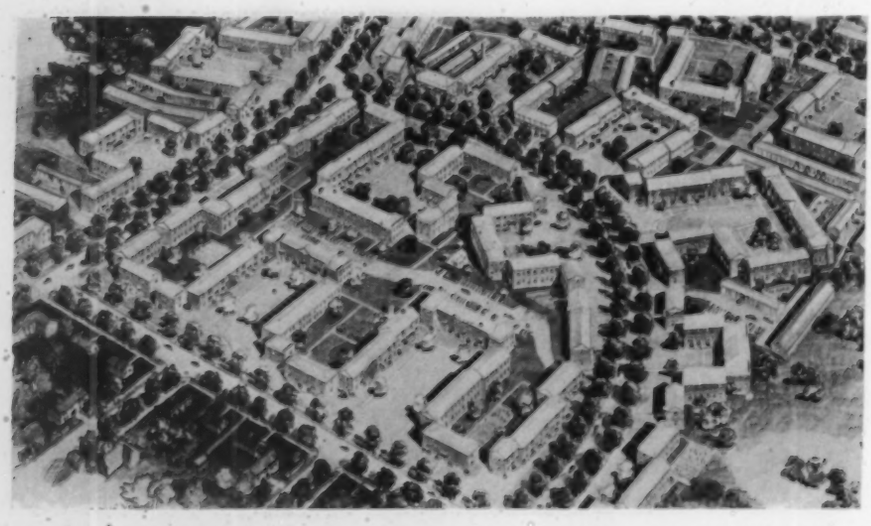
City Planning

The U.S. Chamber of Commerce in summarizing its September conference for businessmen on urban problems, besides traffic congestion, off-street parking and other city planning and community development questions, emphasized the need for rebuilding blighted areas. What is needed, the conference was told, is a unified program involving an entire area large enough to preserve and protect its gains through proper planning and proper zoning. Exercise of the power of eminent domain may be necessary. Use of the cleared space may vary from city to city, but will often be entirely different from the original use, may shift from residential to industrial or commercial development, transportation facilities, parks, etc. Stress was also laid on setting up effective planning organizations.

Greek Contracts Awarded

American engineer-construction companies were awarded $82.4 million in contracts for the construction and rehabilitation of Greek highways, railroads, bridges and ports under the direction of the American Mission for Aid to Greece. The contracts were

(*Continued on page 12*)



Garden apartments for 666 families in East Paterson, N.J. William M. Dowling, architect

RENTAL PROJECT

The second largest rental housing project to be built in New Jersey by private interests has been announced by The Roth-Schenker Corp. The 666-family development in East Paterson will cost more than $6,250,000, will be erected in two sections to be known as Elmwood Gardens and Elmwood Knolls. The site is part of the historic Elmwood Country Club grounds, overlooking the Passaic River.

The apartments will be of the garden type, covering only 25 per cent of the site. All buildings will be two story, brick, with large casement windows. A large number of six-room duplex units will be included, with other apartments ranging in size from 3½ to 5 rooms. All units will have double hardwood floors. William M. Dowling is the architect.

J. FREDERICK KELLY

J. Frederick Kelly, 59, architect and author, died at his home in Hamden, Conn., on September 1 following a long illness.

A graudate of the Yale School of Architecture, Mr. Kelly was architectural adviser to the Connecticut Tercentenary Commission. Widely known as the architect of the New Haven Colony Historical Society Building and many New Haven residences, he was the author of a number of books on architecture, including *Early Domestic Architecture of Connecticut* and *Connecticut Historical Monuments*.

DOUBLE DUTY INSULITE GIVES

Double FOR THE MONEY!

Look at it this way:

Most remodeling jobs need new walls and ceilings. Walls and ceilings need insulation. Therefore why not use a material that gives you *both* for the cost of one? Double-duty INSULITE performs a double service:

(1st) *It Incloses* (2nd) *It Insulates*

One material — double usage. An ideal material for additions to old structures or modernizing all types of old buildings. The large boards are easy to saw and fit. They go up fast but they hold the cost down. And they *insulate* as they build. That's double for anyone's money. More satisfied clients, more repeat business for you, and a reputation for looking to the client's best interests.

Refer to Sweet's File, Architectural Section 10 a/9

INSULATES AS IT BUILDS

BUILDS INSULATES

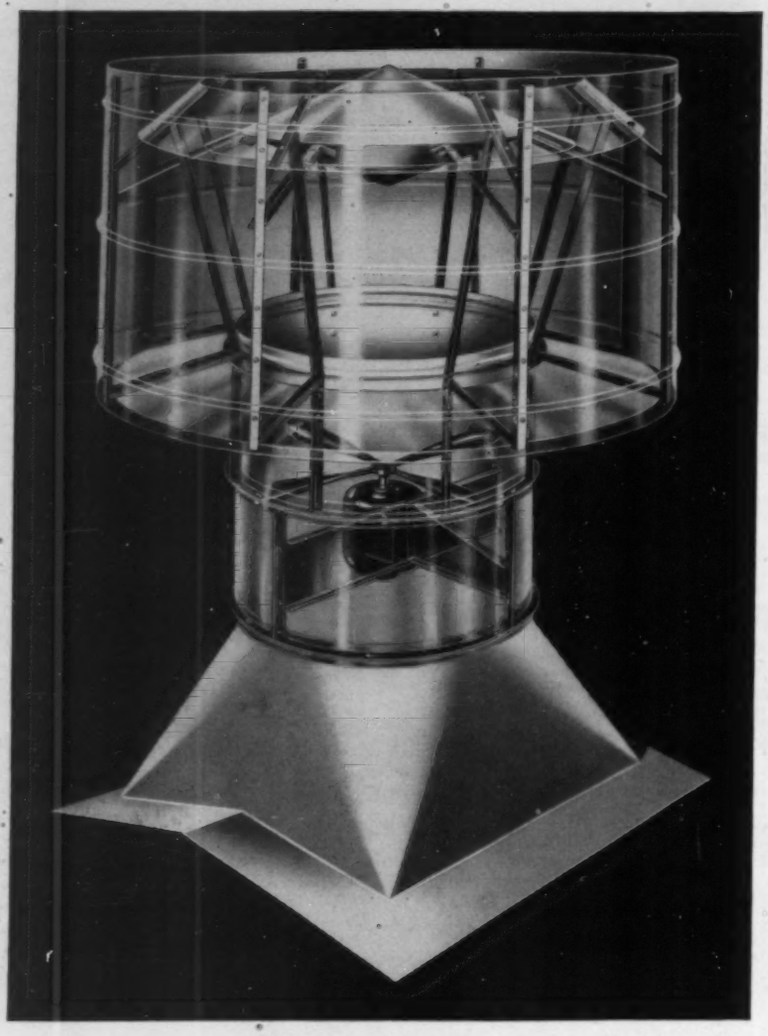
double-duty INSULITE

The GENUINE

"Insulite" is a registered trade mark, U.S. Pat. Off.

INSULITE DIVISION MINNESOTA & ONTARIO PAPER COMPANY MINNEAPOLIS 2, MINNESOTA

BURT FREE-FLOW FAN VENTILATOR



FOR HIGHLY EFFICIENT POWER VENTILATION

When a large volume of air must be exhausted quickly and efficiently, the Burt Free-Flow Fan Ventilator is a logical choice. It may be spotted directly over the area to be ventilated or used on duct work flues to increase their capacities. When its fan is not in use, it serves as an efficient gravity ventilator. With its fan in operation, capacity is greatly increased and positive exhaust is assured regardless of access to wind flow. See Sweet's or write for further information on the efficient Free-Flow Fan and other Burt Ventilators.

WRITE FOR CATALOGS AND DATA SHEETS

The BURT MFG. Co.

48 E. South Street **Akron 11, Ohio, U.S.A.**

VENTILATORS • LOUVERS • OIL FILTERS AND SHEET METAL SPECIALTIES

THE RECORD REPROTS

(*Continued from page 10*)

negotiated on a cost-plus fixed fee basis and are of an inclusive architect-engineer-management type. The one for railroads, highways and bridges for $64 million went to Johnson, Drake, and Piper, Inc., of New York; Guy F. Atkinson, Inc., of San Francisco, and Freeman, Inc., of New York. The one for ports and clearance of the Corinth Canal went to Grove, Shepard, Wilson, and Kruge, Inc., of New York, and J. Rich Steers, Inc., of New York. The third for fabrication of steel for 14 bridges was given to the U.S. Steel Corporation.

Other Developments

Recent federal developments of interest include:

1. The Housing Expediter has removed additional types of construction from control, including city swimming pools, seasonal camps, dude ranches, and certain structures operated by schools or churches.

2. A reshuffle of divisions in the National Bureau of Standards has brought about a new unit called "Building Technology." This division will take up building codes, behavior of building materials, fire protection, heating, air conditioning, equipment and fixtures.

3. Developments of the past decade in American housing and city planning are being passed along to Germany to overcome the "blackout of outside ideas and progress" under the Nazi regime. The War Department is sending to military government officials in Germany more than 2000 photographs and plans and a special library of books and documents. Architectural designs and construction methods are included. The architectural section shows a variety of American building types, from houses, shops and office buildings to community centers, supermarkets and parking terminals.

❖ ❖ ❖

ON THE CALENDAR

Sept. 15–Oct. 11: Exhibit, "Visualizing the Modern House" (architectural, interior and landscape designs, furniture, paintings, sculpture, pottery), Bertha Schaefer Gallery, 32 E. 57th St., New York City.

Sept. 16–Nov. 23: Exhibition of the architecture of Mies van der Rohe, Museum of Modern Art, New York City.

Oct. 14–19: 1947 Westchester Better Homes Exposition, Westchester County Center, White Plains, N.Y.

Oct. 18–24: National Metal Exposition, International Amphitheatre, Chicago.

(*Continued on page 14*)

IS 3¢ A DAY TOO MUCH TO PAY FOR QUIET?

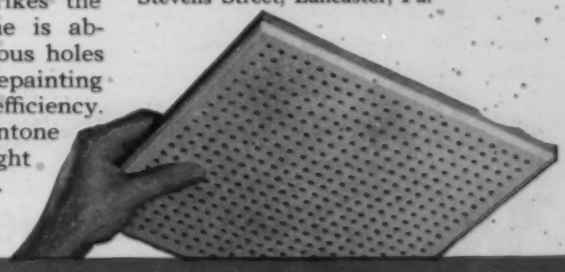
Do your clients know that for 3¢ a day they can have quiet restaurants and dining rooms where meals are undisturbed by clattering dishes, jangling silverware, and loud voices?

Actually, 3¢ a day, figured over a year or two, is all it costs to put a ceiling of noise-absorbing Armstrong's Cushiontone acoustical tile over the average dining area of 20 sq. ft. per patron. And it's a cost that is repaid over and over by satisfied patrons who keep coming back.

As much as three-quarters of all the sound that strikes the surface of Cushiontone is absorbed in the 484 fibrous holes of each 12″ square. Repainting will not affect this high efficiency.

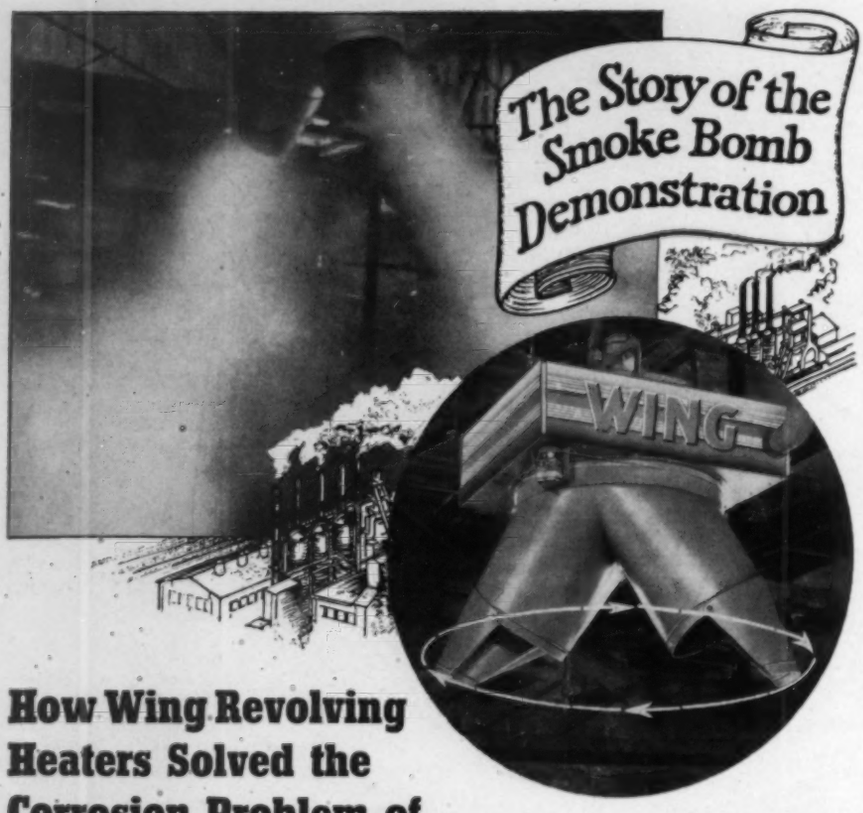
Armstrong's Cushiontone is a good reflector of light and is easy to maintain. It provides extra insulation.

WRITE FOR FREE BOOKLET, "What to Do About Restaurant Noise." Armstrong Cork Company, Acoustical Dept., 2410 Stevens Street, Lancaster, Pa.



ARMSTRONG'S CUSHIONTONE

Armstrong Cork Company (A) Lancaster, Pennsylvania



How Wing Revolving Heaters Solved the Corrosion Problem of a Cold Strip Steel Mill

A LARGE eastern steel plant had a serious heating problem. In a storage building 112′ x 75′ with 34′ truss height, heated by nearly 4,000,000 Btu/hr wall type heaters, thermostatically controlled, they were continually losing hundreds of dollars worth of finished steel through corrosion.

A Wing sales engineer claimed that the "sweating" which caused the corrosion could only be eliminated by uniformly moving warm air over the entire floor. He offered to demonstrate how Wing Revolving Heaters could accomplish this by using 3 minute smoke bombs to cover the entire area around each pile of cold strip and to dissipate this blanket of smoke in 3 more minutes after the bombs were out.

Two Wing Revolving Heaters were installed and 3 bombs were set off over the fan inlets. The results were perfect. A blanket of smoke covered every pile of strip thoroughly and uniformly, and three minutes after the bombs were out, the smoke was as uniformly dissipated.

These two heaters deliver 2,039,350 Btu/hr giving 70° F. room temperature at 0° F. outside and with one air change per hour. Temperature difference between floor and roof truss varies only from 1° to 2° F.

They have never lost a coil of cold strip since the Wing Revolving Heaters were installed.

Write for Bulletin HR-5

L. J. Wing Mfg. Co., 151 W. 14th St., New York 11, N. Y.

Factories: Newark, N. J. and Montreal, Canada

Wing REVOLVING UNIT HEATERS

THE RECORD REPORTS

(*Continued from page 12*)

Oct. 19–24: 28th Annual Meeting, American Welding Society, Hotel Sherman, Chicago.

Oct. 20–23: Annual Fall Meeting, Iron and Steel Division and The Institute of Metals Division, American Institute of Mining and Metallurgical Engineers, Stevens Hotel, Chicago.

Oct. 20–24: Theater Engineering Conference and 62nd Semi-Annual Convention, Society of Motion Picture Engineers, Hotel Pennsylvania, New York.

Oct. 22–25: 1947 Convention, New York State Association of Architects, Hotel Commodore, New York City.

Nov. 3–7: 2nd International Lighting Exposition and Conference, Stevens Hotel, Chicago.

Nov. 9–14: 40th Convention, National Association of Real Estate Boards, San Francisco, Calif.

Nov. 10–13: 25th Annual Convention, The American Institute of Steel Construction, Inc., Roney Plaza Hotel, Miami Beach, Fla.

Dec. 2–5: Annual Meeting, American Society of Mechanical Engineers, Chalfonte-Haddon Hall, Atlantic City, N. J.

P.C. PLANS EXHIBITS

A related series of building products and equipment exhibits sponsored by its chapters in principal cities has been initiated by the Producers' Council. The first exhibit was held at the Hotel Commodore, New York City, October 1–2, sponsored by the New York chapter.

CONSTRUCTION OUTLOOK IS ENCOURAGING

A contraseasonal increase in investment commitments for construction is revealed in F. W. Dodge Corporation tabulations of project contracts awarded in July in the 37 states east of the Rocky Mountains.

The Dodge field staff filed reports on 28,734 projects reaching the contract-award stage in July. These projects have a total value of $660,254,000, representing a gain of 9 per cent over the valuation of June contracts and a decline of 8 per cent from the total for July of last year. Nearly all districts showed an upswing over June, the exceptions being western Pennsylvania and West Virginia, eastern Missouri, southern Illinois, western Tennessee and Arkansas. In most areas the July volume also exceeded the total for July of last year.

Residential and nonresidential construction shared in the increase over June, but heavy engineering contract valuations were down 11 per cent from

(*Continued on page 16*)

HOW TO TAKE THE *Chill* OFF ECONOMY

Economy is a "must" in the design and construction of many a home today. But economy need not be cold and repellent. At modest cost, Curtis Woodwork can add the extra charm and convenience that mean so much to the home owner—as witness this Curtis entrance (Design C-1767). One of many new Curtis entrances, it is priced for the modest building budget. All Curtis entrances are toxic and water-repellent treated.

For the small home or apartment—for dining room, bathroom, or any room—these Curtis cases will fit in for almost any use. They may be built-in in corners or walls, or set out in the room. (Curtis Design C-6571.) Priced to meet the smallest budget. Curtis offers a selection of eighteen styles of wall and corner cases. All are shown in large size in the new Curtis catalog.

When in New York, visit the Curtis Woodwork display at Architects' Samples Corporation, 101 Park Avenue.

Nothing makes a room more homelike than a well-chosen built-in cabinet. This one (Curtis Design C-6558) is suitable for any room of the house. It is also made for corner installation. One of many new designs.

The "magic touch" for making a room modern and friendly is a Curtis mantel. This design (C-6049) has an inspired simplicity, yet it is smart enough to meet today's demands. Like all Curtis Woodwork, it is built with the precision of fine furniture.

Have your Curtis dealer show you the big new Curtis Woodwork Style Book—an entirely new and different way of presenting the Curtis Woodwork line. Measuring 15 x 19 inches, this book contains 100 pages of beautiful woodwork styles and decorative ideas in natural home settings—many photographs in full color.

1866 CURTIS WOODWORK

Curtis Companies Service Bureau
AR10W Curtis Building
Clinton, Iowa

Gentlemen: Please send me your book on the new Curtis Woodwork line.

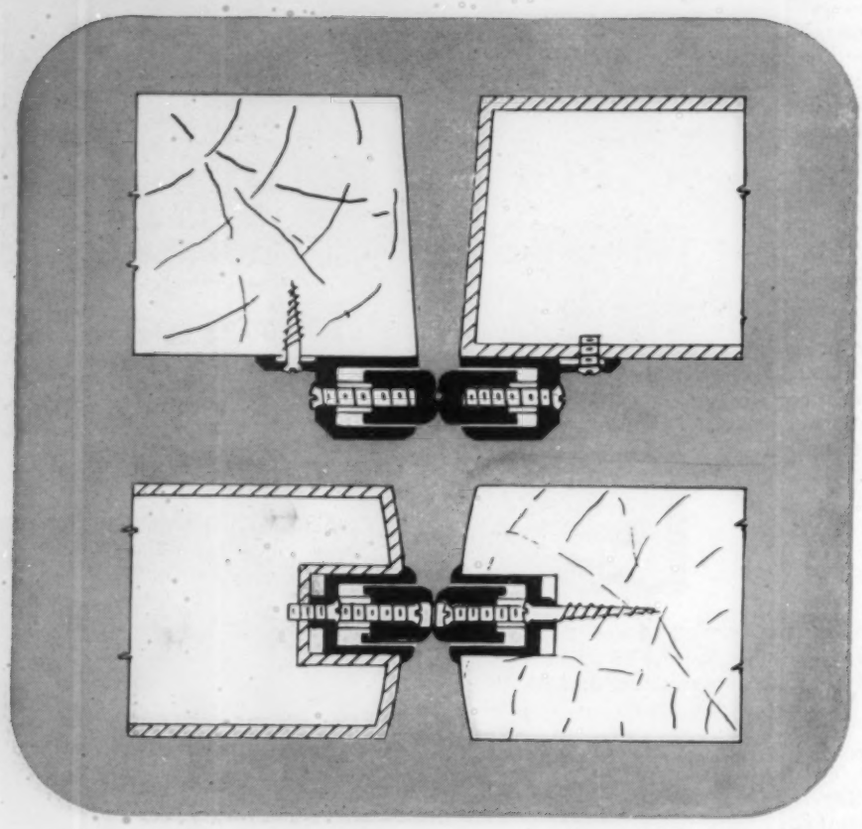
Name.....

Address.....

City.....*State*.....

I am ☐ Architect, ☐ Contractor, ☐ Prospective Home Builder, ☐ Student
(*Please check above*)

MICHAELS
adjustable Astragals



Made of extruded bronze, aluminum or nickel, Michaels Adjustable Astragals compensate for the expansion or contraction of doors. By keeping doors closed as tightly as possible, you eliminate drafts, air currents, and help to keep out dirt and dust. These astragals are simple, practical, rugged... easily installed and adjusted, and are available in several styles for any type of door. Type "A" shown in the illustration at the top, may be applied to either wood or hollow metal bevel doors. Or as a stop bead, or at the bottom of doors. Type "E" shown in the second illustration may be applied to bull-nose hollow metal or wood double doors, or at the bottom of doors. Folder containing complete details and specifications will be sent on request. We shall also be glad to send you information on any or all of the other products manufactured by Michaels.

MICHAELS PRODUCTS

Fixtures for Banks and Offices
Welded Bronze Doors
Elevator Doors
Elevator Enclosures
Check Desks (standing and wall)
Lamp Standards
Marquise
Tablets and Signs
Name Plates
Astragals (adjustable)
Railings (cast and wrought)
Building Directories
Bulletin Boards
Cast Radiator Grilles
Grilles and Wickets
Kick and Push Plates
Push Bars
Cast Thresholds
Extruded Thresholds
MI-CO Parking Meters
Museum Trophy Cases

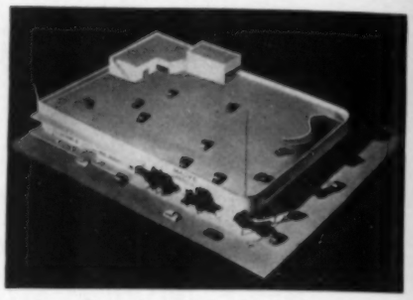
THE MICHAELS ART BRONZE COMPANY, 234 Scott St., Covington, Ky.

Member of the National Association of Ornamental Nonferrous Metals Manufacturers

THE RECORD REPORTS

(*Continued from page 14*)

the previous month. Nonresidential contracts increased by 21 per cent and residential by 15 per cent. The gain in single-family dwelling construction, both for owner-occupancy and for sale or rent by operative builders, was particularly marked. Apartment house construction contracts declined from the June level but were appreciably higher than the volume reported for July of last year.



Macy's new Jamaica branch features rooftop parking for approximately 150 cars

BUILDING NOTES

New Store

Opened for business on September 2, Macy's-Jamaica — second in a chain of four suburban branches of the New York City department store — is a two-story limestone building offering roof parking for approximately 150 cars. The rooftop garage is reached by a ramp, and connected with the selling floors by escalators.

The building is fully air conditioned, lighted by a combination of fluorescent and incandescent. Architects were Robert D. Kohn and John J. Knight.

Hospital Enlargement

Work has begun on the $7,000,000 Alfred E. Smith Memorial at St. Vincent's Hospital, New York City. The project includes a 10-story building to replace part of the present hospital, remodeling and modernization of the present main building, and a 2-story central kitchen and laundry beneath the present interior courtyard. All work will be accomplished without interruption of the normal operation of the hospital.

The new building will be of structural steel frame with red brick exterior and limestone trim. The eight upper floors will be used for private wards, semi-private and private rooms. Administration offices will occupy the first floor, and the kitchen and dining rooms for nurses, doctors and hospital personnel will be located on the second.

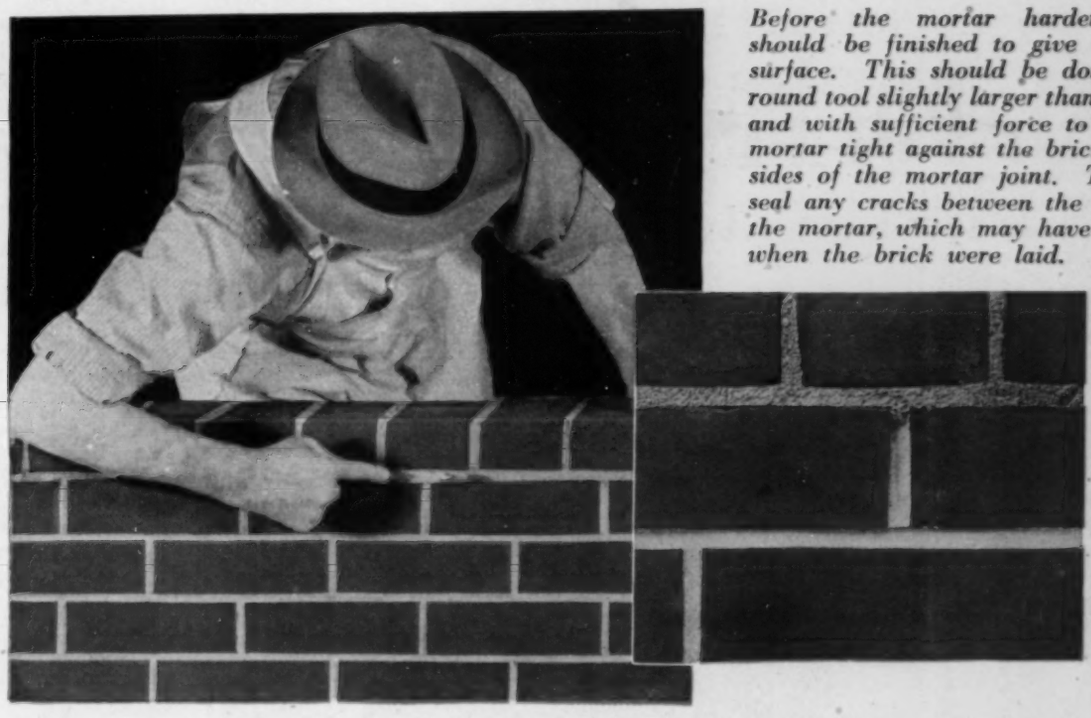
When the modernization program has been completed the hospital will have

(*Continued on page 18*)

BRIXMENT Means BETTER BRICKWORK!

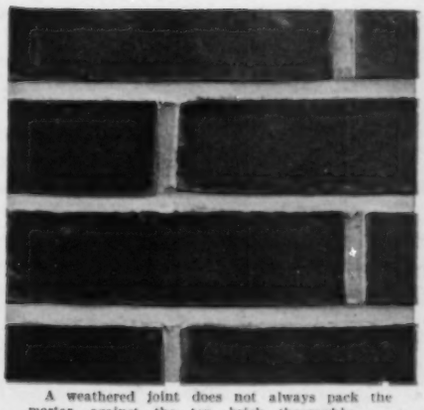
No. 5 OF A SERIES—

THE RIGHT WAY AND THE WRONG WAY—TO FINISH JOINTS

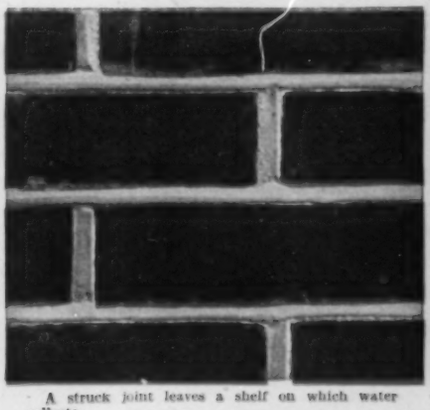


Before the mortar hardens, joints should be finished to give a concave surface. This should be done with a round tool slightly larger than the joint, and with sufficient force to press the mortar tight against the brick on both sides of the mortar joint. This helps seal any cracks between the brick and the mortar, which may have been left when the brick were laid.

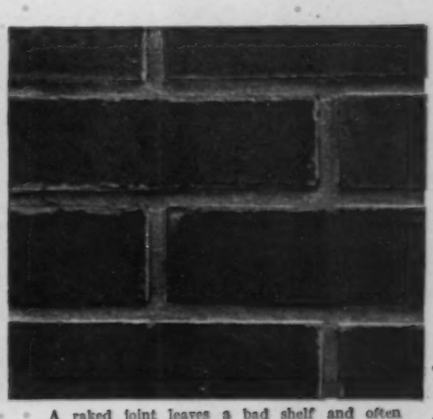
Concave joints should always be used for face brick, unless the architecture requires some other type of finish. No other type of joint provides as much protection against the entrance of water.



A weathered joint does not always pack the mortar against the top brick thoroughly.



A struck joint leaves a shelf on which water collects.



A raked joint leaves a bad shelf and often contains too little mortar especially in the head joint.

Because of its greater plasticity and water-retaining capacity, Brixment mortar enables the bricklayer to do neater, faster work, *even in finishing the joints.*

In addition to its plasticity and higher water-retaining capacity, Brixment has greater bonding quality, greater resistance to freezing and thawing, and freedom from efflorescence. Because of this combination of advantages, Brixment is the leading masonry cement on the market.

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

SAVE TIME WITH

CHISEL POINT LEADS

Longer Lines...Less Sharpening

An exclusive Eberhard Faber development... *rectangular shaped leads* that produce longer lines than the conventional round shape leads and lines of unvarying width... lines of HI-DENSITY quality —opaque, dense, better for blueprints. And you save up to 20% *more time between sharpenings.* As for quality, you get a genuine MICROTOMIC VAN DYKE lead; the only difference is it's "pre-shaped"—it's "CHISEL SHAPED"—for your convenience in sharpening and in use.

"VAN DYKE" EBERHARD FABER U.S.A. — 2H CHISEL POINT HI-DENSITY — MICROTOMIC GRAPHITE

AR-10

FREE!

Check the Degree you'd like to try and mail this coupon to:

EBERHARD FABER

37 Greenpoint Avenue, Brooklyn 22, New York

☐ No. 4B ☐ No. 2B ☐ No. HB
☐ No. 2H ☐ No. 4H ☐ No. 6H

"Chisel Points" are made in only these *six* degrees.

Name .....

Firm .....

Address .....

City .....State.....

Dealer's Name.....

Exclusive with the EBERHARD FABER MICROTOMIC VAN DYKE

THE RECORD REPORTS

(*Continued from page 16*)

the most up-to-date facilities throughout, including pneumatic tube systems for carrying records and drugs to various parts of the hospital and a central oxygen service that will eliminate the carting of tanks through the buildings. The present power plant will be abandoned and all steam and electricity needed will be obtained through street service and public utilities. Eggers & Higgins are architects for the project.

New Interior, Old Hotel

The expected and logical trend toward the rejuvenation of old hotels rather than the building of new ones has been given added impetus by the recent announcement of plans for the Hotel Biltmore in New York City. The 34-year-old Biltmore is to be practically rebuilt with no interruption of service.

Every facility is being ripped out and entirely renewed throughout the 1000-room, 28-story building. All eight passenger elevators are being replaced, as are the freight and service elevators. New bathroom, kitchen and laundry fixtures and equipment already have been installed, including tiled floors and fluorescent lighting in the 18th floor kitchen and Bowman Room's pantry, and a new service bar in the Bowman Room.

The original Georgian furnishings of the hotel are giving way to a sort of "modern Georgian" — a theme which is being carried out in draperies, wall coverings and other decorations.

LEGION RAPS T-E-W

At their recent annual convention in New York the American Legion expressed emphatic disapproval of the Taft-Ellender-Wagner Bill, voting down resolutions approving the measure by 2796 to 722.

Commenting on this decisive vote, the National Association of Home Builders says in its Washington Letter: "This was in effect a demand by the veterans for preservation of a free economy in this country and the elimination of all communistic and socialistic influences throughout government and industry."

Says the National Association of Real Estate Boards: ". . . the overwhelming proportion of veterans fully realize that our system of competitive freedom is the only road to an adequate supply of good housing. . . . [Their] thumping rejection of the bill is certain to impress Congress."

The Legion did adopt other housing resolutions, however, including one which would oust non-veteran tenants from public housing if their incomes are

(*Continued on page 20*)

Announcing Preslok
TRADE MARK

The amazing KEYLESS LOCK with push button control

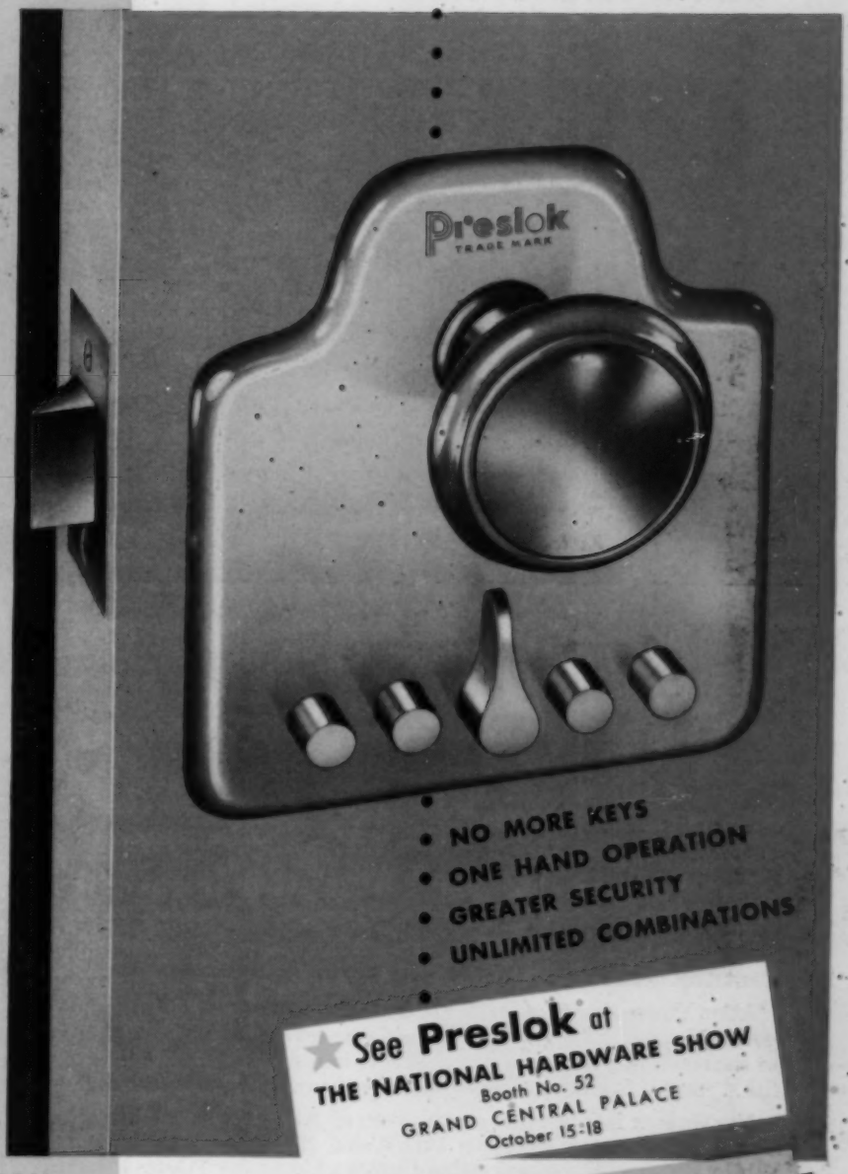
Here at last—a lock so radically different, so utterly new and simple—you'll wonder how you ever got along with old-fashioned key locks! No more fussing and fumbling for key or keyhole — PRESLOK is keyless. Four small buttons hold the secret of a PRESLOK combination — yet the nation's leading locksmiths have failed to open this lock.

SIMPLE • CONVENIENT • SECURE

Flick a lever — PRESLOK locks. Tap out an easy combination — PRESLOK opens . . . and opens with one hand! PRESLOK is sturdily constructed for heavy duty — precision-built like a fine watch. PRESLOK is easily installed on most types of doors—old or new—adding strength to your door, as well as beauty, convenience, and greater security.

MAIL THE COUPON . . .

For complete information and specifications of this new patented lock, mail the coupon today. Be sure that you have full details on PRESLOK—successor to the key lock.



- NO MORE KEYS
- ONE HAND OPERATION
- GREATER SECURITY
- UNLIMITED COMBINATIONS

★ See **Preslok** at
THE NATIONAL HARDWARE SHOW
Booth No. 52
GRAND CENTRAL PALACE
October 15-18

SECURITY LOCK CORPORATION
WALDEN, N. Y.

Preslok
YOUR FINGER IS THE KEY
TRADE MARK

MAIL COUPON TODAY - - - - - - -

SECURITY LOCK CORPORATION, Dept. A-1, Walden, N.Y.

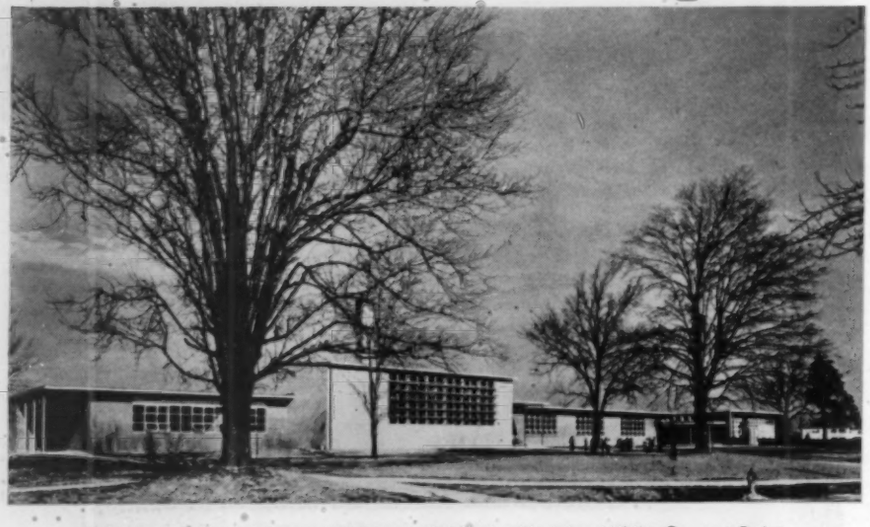
Please provide us with full information, specifications and price quotations on **PRESLOK.**

NAME _____

ADDRESS _____

CITY _____ STATE _____

Just as a well-dressed man wears a WHITE shirt with a colorful tie



Norwayne School, Wayne, Michigan, finished with Atlas White Cement Paint.

Concrete craftsmen choose Atlas White Cement

Most men prefer a white shirt because it is clean and fresh-looking . . . and because it points up the color and design of a necktie. The same applies to Atlas White Cement. It, too, is clean and fresh-looking . . . and sets off the color values of aggregates or pigments in Terrazzo, Stucco, Cement Paint and Architectural Concrete Slabs. Such a "background" has the uniform clarity to complement the desired color overtones, whether in contrast or blend.

Atlas White complies with Federal and ASTM specifications for portland cement. It has the same advantages for concrete and is used in the same way. Atlas White concrete looks clean, fresh and colorful . . . and it is easy to keep that way. Maintenance costs are low.

For further information on the uses of Atlas White Cement, see SWEET'S Catalog, Sections 12B/7 and 13B/7, or write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, New York.

AR-C-20

FOR BEAUTY AND UTILITY

ATLAS WHITE CEMENT

FOR TERRAZZO, PAINT, SLABS, STUCCO

"THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries Sunday Evenings—ABC Network*

THE RECORD REPORTS

(*Continued from page 18*)

over the prescribed maximum, replacing them with veterans, and another supporting current housing investigations.

BRITISH HOUSING

The latest housing figures issued by the British government show that, despite economic and labor difficulties, Britain is making real progress with the relief of her housing shortage. Since 1945 when rebuilding began, 111,587 permanent houses have been completed, and 115,329 temporary prefabricated dwellings have been erected. Of these, 11,922 permanent homes were completed in June as against 11,759 in May and 9720 in April. New and rebuilt houses constructed by local authorities total 58,774; those built by private firms on their own account, 51,050. Including the prefabs, 79 per cent of new dwellings are rentals.

To increase the productivity of the building industry, Britain's government has put forward a "payment by results" plan. Executive committees of the building trade unions are recommending acceptance of this policy, and it is expected the unions will follow suit.

BASIC BUILDING CODE ALMOST READY

After many months of intensive work by 70 building code experts, the basic building code of the Building Officials Conference of America, Inc., was presented to industry factors at the joint annual meeting of the Conference and the Building Officials Foundation in Columbus, Ohio, September 22–25. The code now will be given wide distribution among municipal and state building departments and other industry groups and factors for their study and recommendations.

AT THE SCHOOLS

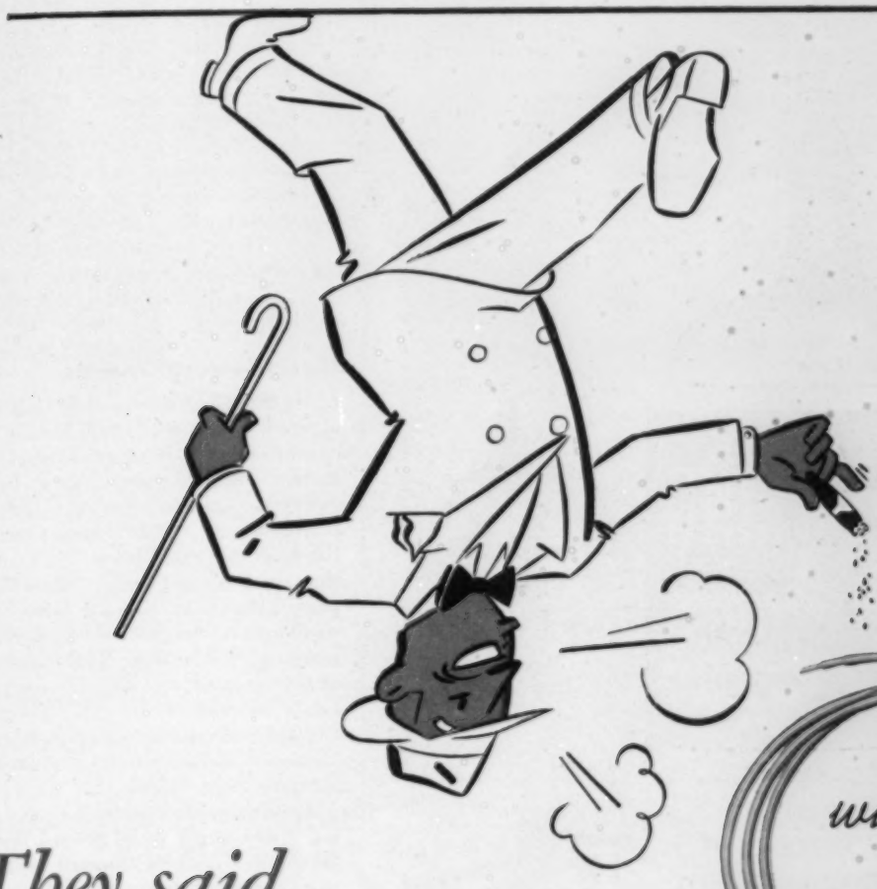
New Courses in Planning

Columbia University is expanding both day and evening programs for those interested in urban development, planning, housing and public administration. Four new courses in this general field have been announced for this fall. Three of them will be given in the evening, and will be offered in the Planning and Housing Division and through the School of General Studies. The fourth will be a late afternoon course offered through the Department of Public Law and Government. For further information address J. Marshall Miller, Director, Planning and Housing Division, School of Architecture, Columbia University, New York.

(*Continued on page 22*)

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE



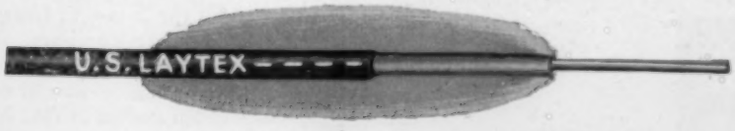
They said it couldn't be done!

Quite a few people didn't believe a natural rubber-covered building wire could have the smallest diameter in the business and *at the same time* have no equal in physical and electrical properties.

But that was before U. S. Rubber Company scientists produced Laytex (Type RU). Today, Laytex is the wire man's delight. Its small diameter permits more circuits per conduit. By means of a special dip process, Laytex is insulated with 90% unmilled grainless natural rubber. The conductors are perfectly centered in this insulation, thereby avoiding any chance of thin spots.

Laytex (Type RU) is lighter in weight, easier to install. The saturated cotton fibrous cover is flame-retardant and moisture-resistant.

UNITED STATES RUBBER COMPANY
1230 Avenue of the Americas · Rockefeller Center · New York 20, N. Y.



Specify RU **Laytex*** **ELECTRICAL WIRES AND CABLES**

RU wiring with **RU?** *it's the coming "Code" wire*

SAFETY FACTORS THAT PUT *RU* OUT IN FRONT

BULL'S EYE
The conductor is on dead center throughout every inch of the wire.

ELEPHANT INSULATION
Laminated walls of tough natural rubber insulation mean Laytex is safe.

SMALLER O.D.
Allows more circuits per conduit than in ordinary wire. Lighter weight.

*Reg. U. S. Pat. Off.

SILV-A-KING
Lighting Equipment
A complete line of quality lighting units from a single source.
COMMERCIAL
INDUSTRIAL
FLUORESCENT
INCANDESCENT
SILV-A-KING lighting equipment has been incorporated in major installations, throughout the country, for over a quarter-century . . . a tribute to craftsmanship . . . to modern manufacturing methods . . . to a continuing program of research into every phase of illumination.
SILV-A-KING Lighting Equipment is sold exclusively through recognized electrical wholesalers.
SILV-A-KING LIGHTING EQUIPMENT
BRIGHT LIGHT REFLECTOR CO. INC.
subsidiary of
BRIDGEPORT PRESSED STEEL CORP.
Bridgeport 5, Conn.
RLM

THE RECORD REPORTS

(*Continued from page 20*)

Registration Review

The Institute of Design and Construction, under the direction of Vito P. Battista, M. Arch., A.I.A., is now located in larger quarters at 26 Court St., Brooklyn 2, N.Y.

One of the objectives of the school is to aid technical men and women in their preparation for the New York State Registration Examination for Architects. Classes are offered in all subjects covered by the examination. Veterans are accepted under the G.I. Bill of Rights.

Illinois Research Projects

An extensive time-and-motion study of site fabrication of small homes, in an effort to furnish the small contractor and builder with information as to how he can reduce construction costs, has been started by the Small Homes Council of the University of Illinois. Six houses of the same plan and design will be built as part of the study, which is being carried on in cooperation with the U. S. Department of Commerce. The houses are adaptations of the industry-engineered house developed by the Producers' Council and the National Retail Lumber Dealers Association (see ARCHITECTURAL RECORD, Sept. '47, pp. 74–79).

Another project under way at Illinois is a study of the trend toward the first-floor home laundry, located near or in the kitchen. Still another is a study of 10 different types of concrete-slab floors in an attempt to ascertain the most economical way to build a dry, comfortably warm concrete-slab floor for a basementless house. The floors will be tested for temperature variations and moisture conditions.

Medalist Named

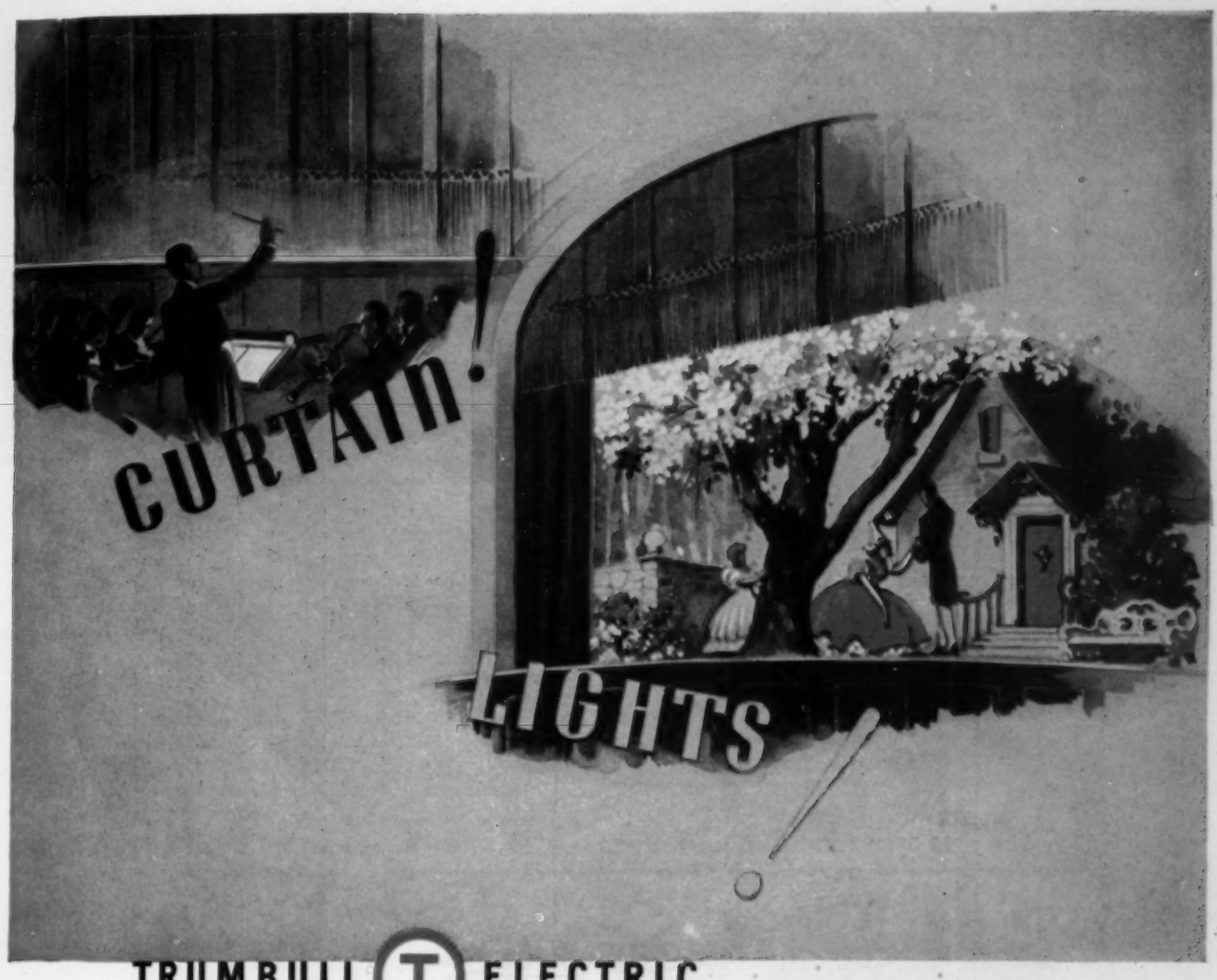
Dr. C. H. Mathewson, professor of metallurgy at Yale University, has been awarded the Gold Medal of the American Society for Metals for 1947. The award will be made in Chicago this month at the annual banquet of the A.S.M. during the National Metal Congress and Exposition.

New Scholarships

The trustees of the James F. Lincoln Arc Welding Foundation have announced the resumption of their annual engineering undergraduate award and scholarship program started in 1942 and interrupted by the war.

The program, with a total value of $6750, contains two interdependent plans: the award plan and the scholarship plan. Under the first, engineering

(*Continued on page 166*)



TRUMBULL (T) ELECTRIC

CONTROLITE

the equipment that makes LIGHTING *a part of the Show*

The next time you settle down in your seat to enjoy a swell show, spare a few seconds of professional thought to the stage lighting installation. You may or may not realize how much of an engineering job it is to achieve that smooth interlocking of house and stage lighting and the perfection of color harmony and intensity in "painting with light" as the play goes on. Some of the finest switchboard and control jobs in the country are in our big theatres . . . and a great many of them bear the Trumbull Electric Controlite nameplate . . . typical of the advanced precision electrical engineering that characterizes all Trumbull Electric products.

THE TRUMBULL ELECTRIC MANUFACTURING CO., PLAINVILLE, CONNECTICUT
OTHER FACTORIES AT NORWOOD, OHIO, SEATTLE, SAN FRANCISCO, NORTH HOLLYWOOD

(T)

CONTROLITE Stage Lighting Control Boards are, like all Trumbull Electric Products, sold through Electrical Wholesalers and installed by Electrical Contractors. Trumbull Engineering services contribute a wealth of specialized experience in this highly technical field.

CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929=100

Compiled by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data collected by E. H. Boeckh & Associates, Inc.

NEW YORK

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	136.1	136.9	123.3	123.6	122.6
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1941	134.5	135.1	135.1	137.2	134.5
1942	139.1	140.7	137.9	139.3	137.1
1943	142.5	144.5	140.2	141.7	139.0
1944	153.1	154.3	149.6	152.6	149.6
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
Apr. 1947	217.6	220.8	204.7	205.9	202.4
May 1947	219.1	221.6	205.6	206.8	203.4
June 1947	219.3	221.8	205.9	207.0	203.6
July 1947	223.4	225.0	211.2	212.5	206.6
	% increase over 1939				
July 1947	**80.8**	**83.7**	**61.6**	**59.2**	**58.8**

ATLANTA

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	122.8	122.9	108.6	109.8	105.7
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1941	97.5	96.1	99.9	101.4	100.8
1942	102.8	102.5	104.4	104.9	105.1
1943	109.2	109.8	108.5	108.1	108.7
1944	123.2	124.5	117.3	117.2	118.2
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	135.1
Apr. 1947	179.2	183.3	154.4	153.5	153.5
May 1947	180.2	183.9	155.1	154.1	154.2
June 1947	180.4	184.1	155.4	154.3	154.4
July 1947	184.0	187.9	160.3	159.6	158.8
	% increase over 1939				
July 1947	**113.3**	**126.0**	**68.6**	**63.9**	**67.7**

ST. LOUIS

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	118.1	121.1	112.1	110.7	113.1
1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1941	118.8	118.0	121.2	121.7	122.2
1942	124.5	123.3	126.9	128.6	126.9
1943	128.2	126.4	131.2	133.3	130.3
1944	138.4	138.4	135.7	136.7	136.6
1945	152.8	152.3	146.2	148.5	145.6
1946	167.1	167.4	159.1	161.1	158.1
Apr. 1947	199.1	200.3	178.0	179.0	176.9
May 1947	199.3	200.5	178.3	179.2	177.1
June 1947	202.2	202.2	182.8	185.4	182.1
July 1947	205.6	207.2	187.8	187.8	187.5
	% increase over 1939				
July 1947	**86.5**	**93.2**	**58.2**	**56.8**	**57.5**

SAN FRANCISCO

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	108.8	107.5	115.2	115.1	122.1
1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1941	116.3	112.9	120.5	123.4	124.3
1942	123.6	120.1	127.5	129.3	130.8
1943	131.3	127.7	133.2	136.6	136.3
1944	139.4	137.1	139.4	142.0	142.4
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
Apr. 1947	188.6	187.0	177.8	180.4	180.7
May 1947	188.8	187.2	178.1	180.6	180.9
June 1947	189.0	187.4	178.4	180.8	181.1
July 1947	195.1	194.0	186.6	190.6	188.0
	% increase over 1939				
July 1947	**84.8**	**95.5**	**58.9**	**56.4**	**61.3**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

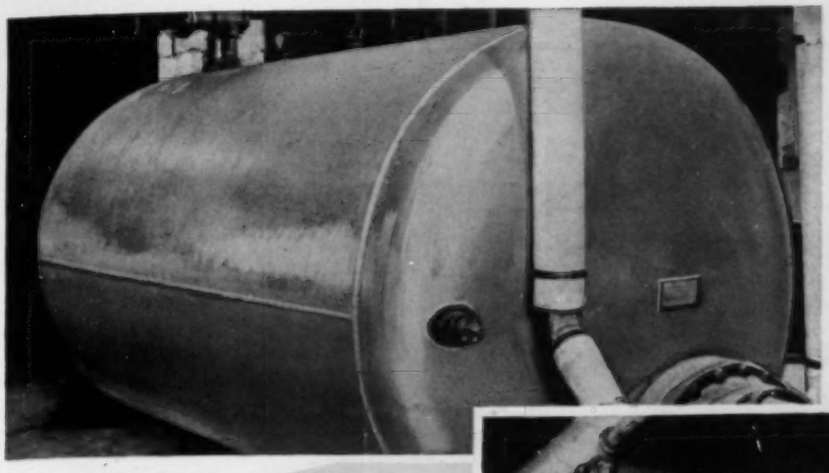
Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus, indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.



At Left—Whitlock Everdur Type K Heater built for a New York laundry by The Whitlock Manufacturing Co., Hartford, Conn., replaced a rustable heater which had failed after LESS THAN FIVE YEARS OF SERVICE!

Below—This all-welded Patterson Everdur Water Heater was specially designed and manufactured by The Patterson-Kelley Co., Incorporated, East Stroudsburg, Pa., for a Pittsburgh bank. It maintains a working pressure of 100 pounds.

NO MORE RUST

with Storage Tanks of *Everdur*

ANY hot water storage heater is a major equipment item. Welded tanks of Everdur* Copper-Silicon Alloys protect the original investment and provide long and economical service.

Everdur Alloys are characterized by high strength, ready weldability by standard methods, and resistance to corrosion equivalent to that of copper. Everdur storage water heaters and service water heaters have long given outstanding satisfaction in many hospitals, laundries, textile plants, schools, apartments and office buildings. The chemical process industries utilize many types of Everdur pressure vessels where corrosion-resistance is a vital engineering requirement, and long service life is desirable.

Leading equipment manufacturers are experienced in the fabrication of Everdur and will gladly quote on storage water heating and heat transfer requirements.

*Reg. U. S. Pat. Off. 4716

ANACONDA
from mine to consumer

Everdur

COPPER-SILICON ALLOYS

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD.
New Toronto, Ont.

REQUIRED READING

HOME FOR THE U.N.

Report to the General Assembly of the United Nations by the Secretary-General on the Permanent Headquarters of the United Nations. New York (Morningside Heights), Columbia University Press, 1947. 8 by 12 in. 96 pp. illus. $2.50.

While this report on the projected permanent headquarters for the United Nations has been circulating in some quarters since July, it has not been generally available until now. It is the official report submitted to the General Assembly on the basic requirements and general features as worked out by Director of Planning Wallace K. Harrison and his Board of Design Consultants.

Although the final plans and the architectural treatment have yet to be decided upon, this report gives a surprisingly vivid picture of what the home of the U. N. probably will be like. It is all here: site analysis, space requirements, special needs, site plan, preliminary floor plans, housing, cost estimates, transportation to and from the site. Much of this is already familiar, particularly to readers of the ARCHITECTURAL RECORD (see April, 1947 issue, pp. 72–81), but the greater part of it has not been published heretofore. Apart from its intrinsic interest as a historical document, this is a valuable guide book for the architect and/or engineer embarking on a new project requiring exhaustive research.

PLANNING FOR INDIA

Patrick Geddes in India. Edited by Jaqueline Tyrwhitt in cooperation with H. V. Lanchester and Arthur Geddes. Introduction by Lewis Mumford. London W.C. 1, Eng. (12 Bedford Sq.), Percy Lund, Humphries & Co. Ltd., 1947. 5½ by 8½ in. 104 pp. illus. 10s.

Impressive in these excerpts from his reports on 18 Indian cities some 30 years ago is the soundness of Patrick Geddes' whole attitude toward city planning. Unlike many later planners, Geddes did not consider it imperative to wipe the slate clean before writing thereon. He was a proponent of "conservative surgery" and a firm believer in the simple solution. "The policy of sweeping clearances," he says, "should be recognized for what I believe it is; one of the most disastrous and pernicious blunders in the checkered history of sanitation."

That Geddes was years ahead of his generation in city planning never was more obvious than it is in these few carefully selected passages. As Lewis Mumford comments in his introduction, "Some of the commonplaces of the most advanced modern practice, such as reducing the number and width of paved streets in residential areas, and turning the land saved into more usable forms of open space, were typical Geddesian innovations: characteristic of the life-economy he preached and practiced."

This is a small book, but a rewarding one. It is full of a sound wisdom and a sympathetic understanding of custom and tradition which are all too frequently missing in the development programs of today.

SULLIVAN SPEAKS

Kindergarten Chats and Other Writings. By Louis H. Sullivan. Edited by Isabella Athey. New York 22 (38 E. 57th St.), Wittenborn and Co., 1947. 7½ by 10 in. 252 pp. illus. $4.50.

"The central purpose of the work [the 52 essays comprising KINDERGARTEN CHATS] is to liberate the mind from serfdom to tradition, and to exhibit man's natural powers in their creative capabilities when expanding in the open-air-of-the-spirit-of-responsible-freedom; in other words, the true spirit of democracy. From which it follows that the operation of the historic feudal mind and the advancing democratic mind are placed in sharp contrast. The appeal therefore is to the broad intelligence of the public mind seeking not only a knowledge and understanding of architecture as a plastic art, but, as well, a clear view of its social basis as an art of expression."

Thus wrote Louis Sullivan in a foreword to the revised text of the CHATS, published here for the first time. The series of essays was originally written for young architects, and appeared in 52 consecutive issues of *Interstate Architect & Builder* in 1901–02. In 1918 Sullivan thoroughly revised the text, cutting the length from about 130,000 words to about 100,000, and rewriting six chapters completely. When the essays first appeared in book form in 1934, however (in a limited edition prepared by Claude F. Bragdon and published by the Scarab Fraternity Press), the revised text was not used. Thus this edition is the first to give us the CHATS as edited by Sullivan himself for book-length publications.

THE COMPLETE LE CORBUSIER

Le Corbusier: Oeuvre Complète, 1938–46. Zurich, Switz., Les Editions d'Architecture Erlenbach, 1946. 11 by 9 in. 200 pp. illus. Price not given.

The recent flood of books by and about Le Corbusier now is augmented by the fourth volume in the "Complete Works" edited by Swiss architect Willy Boesiger. Divided into two parts, the first covering Le Corbusier's work from 1938–1940 in collaboration with Pierre Jenneret, and the second his non-collaborative accomplishments since 1940, the volume is curiously disappointing. Most of what it contains has been published before. English readers, furthermore, will be irked by the poor quality of the occasional translations: misspellings are frequent ("forth" for "fourth" throughout the book, for example); and the attempt to be idiomatic often results in a change of meaning.

There is, fortunately, but little text to quibble about. The book is largely given over to reproductions of Le Corbusier's planning studies and drawings. The scope of his work in the eight years is impressive: houses, office buildings, public buildings, city plans, a winter sports center, emergency housing, *brise-soleil*, furniture, institutions — and, of course, the characteristic staccato philosophy binding them all into one individualistic whole.

DESIGNED FOR PLAY

Recreation Areas: Their Design and Equipment. Prepared for National Recreation Assn. by George D. Butler. New York 18 (67 W. 44th St.), A. S. Barnes and Co., 1947. 9 by 12 in. xvi + 174 pp. illus. $6.00.

With communities throughout the country putting more and more emphasis on recreational needs, and plans for war memorials more and more frequently taking the shape of community centers of one kind or another, this new volume by George Butler is a welcome one.

Mr. Butler is concerned primarily with playgrounds, play and athletic fields. He outlines planning principles, gives detailed information on required areas and facilities, makes suggestions as to design, and in general gives all the basic information needed for the intelligent planning of such recreational areas.

While the architect will not be particularly interested in the design and location of sandboxes and wading pools, he will find much of concern to him in the chapter on recreational area buildings, and will find Mr. Butler's book a valuable source in the planning of community centers including swimming pools, basketball courts, and so on. Six types of building, ranging in size from the open shelter to the large recreation center, are discussed in detail, and typical floorplans are given for each. Photographs and diagrams are numerous throughout the book.

THE STORY OF WOOD

Lumber: Manufacture, Conditioning, Grading, Distribution and Use. By Nelson Courtlandt Brown. New York 16 (440 Fourth Ave.), John Wiley & Sons, Inc., 1947. 5½ by 8½ in. xvi + 344 pp. illus. $4.25.

Everyone who ever has built something of wood (and who hasn't?) will find this volume of considerable interest. For here is the story of the lumber industry in the United States from 1625, when

(*Continued on page 30*)

PORCELAIN ENAMEL
can solve many of your
MODERNIZATION PROBLEMS

BEFORE ▲ AFTER ➤

PORCELAIN ENAMEL HAS COLOR

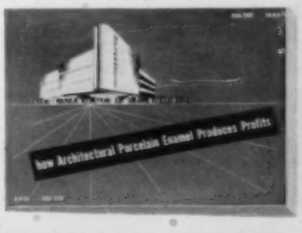
Beautiful colors—from brilliant white to gleaming black—rich hues or delicate pastels—can be obtained in porcelain enamel. Surfaces can be brilliantly glossy or dull matte as you wish.

PORCELAIN ENAMEL IS DURABLE

Non-fading, scratch-resistant, stain-proof porcelain enamel retains its colorful attractive appearance long after less durable materials have lost their charm.

PORCELAIN ENAMEL IS VERSATILE

You can do things with porcelain enamel that you can't do with any other material! For interior or exterior use, for large or small areas, you will find it most versatile. And the design effects you create retain their beauty *for life!*



Send for the brochure, HOW PORCELAIN ENAMEL PRODUCES PROFITS

PORCELAIN ENAMEL INSTITUTE, INC.
1010 VERMONT AVENUE, N. W. WASHINGTON 5, D. C.

EXCLUSIVE—

THERE'S ONLY ONE SPHINX... AND

ONLY ONE—

AW SUPER-DIAMOND FLOOR PLATE

Only AW Super-Diamond Floor Plate has the exclusive pattern which provides three distinctive advantages not found in ordinary floor plate. 1. It Grips Without A Slip (providing maximum underfoot protection against slipping accidents). 2. It's Easy To Clean (use a hose, brush or mop). 3. It's Easy To Match (pattern is cut with minimum scrap). Architects, engineers and designers specify AW Super-Diamond Floor Plate for stair treads, fire escapes, walkways, loading platforms and other places that require economical safeguarding.

FREE—*Write for a copy of our New 16-Page Booklet L33. It's packed full of helpful information. Alan Wood Steel Company, Conshohocken, Pennsylvania.*

AW SUPER-DIAMOND

FLOOR PLATES THAT GRIP

A Product of ALAN WOOD STEEL COMPANY

Other Products: Billets • Plates • Sheets • Carbon & Alloy

REQUIRED READING

(*Continued from page 28*)

the first sawmill in the country was built at Jamestown, Va., to the present.

As professor of forest utilization at the New York State College of Forestry, Nelson Brown has written this primarily as a textbook for forestry students and a reference book for the lumber industry. For that reason he has devoted the major part of it to a detailed discussion of the manufacture and conditioning of lumber, and has written at length of the manufacturing processes, the machinery and equipment in common use, and sawmill procedures. One chapter deals with grades and inspection, another with sizes and price relationships.

Throughout the book Professor Brown has stressed the need for maximum economy and efficiency in lumber production, pointing his entire discussion toward the achievement of that goal.

FURNITURE OLD AND NEW

Furnishing in Style. By Walter Rendell Storey. New York (381 Fourth Ave.), American Studio Books, 1947. 7½ by 10 in. 104 pp. illus. $5.00.

Here is a book on furniture and furnishing which is as entertaining as it is informative. Mr. Storey has enlivened his text with sketches of the ladies of the periods he is describing, and has humanized his discussion as far as possible with stories of how changes in furniture styles have come about.

The first part of the volume takes up various historical styles such as early English, Georgian, Early American, Federal, French, and so on down through the 19th century. The second part is concerned with current styles — many of them, of course, reproductions or adaptations of those already discussed.

The book is largely made up of photos, some of them in color.

MODERN DECORATING

L'Arredamento Moderno. 2nd ed. By Roberto Aloi. Milan, Italy, Ulrico Hoepli Editore, 1947. 9 by 11 in. 342 pp. illus. 3000 lire.

From Italy comes this album of 752 photographs representing the work of 300 individuals and 20 countries. It includes pottery and glassware, china, silver, lighting fixtures, materials, furniture, plumbing, kitchen layouts and equipment, and general interiors. While most of the contributors are Italian, there is a sufficient scattering of Swiss, Argentinian, Austrian, Swedish, German, Dutch, English, Danish and American work to make the volume a good round-up of contemporary design. More interesting, perhaps, is the glimpse it gives of what is considered good modern in Italy itself.

ARCHITECTURAL

RECORD

FROM THE COLLEGE TO THE GRAVE

THE future of architecture is always in the hands, or minds, of the younger generation that will inevitably, if gradually, replace the older practitioners. But the training and education of these young geniuses is always in the hands of older men, older in years and experience but not neeessarily older in ideas, philosophy or vision. In most cases at present (although the practicing professionals may not realize it) the school administrators are forward-looking, anxious to impart both the vision of and the means toward an architecture in tune with, expressive of, and serviceable for, the life of the times.

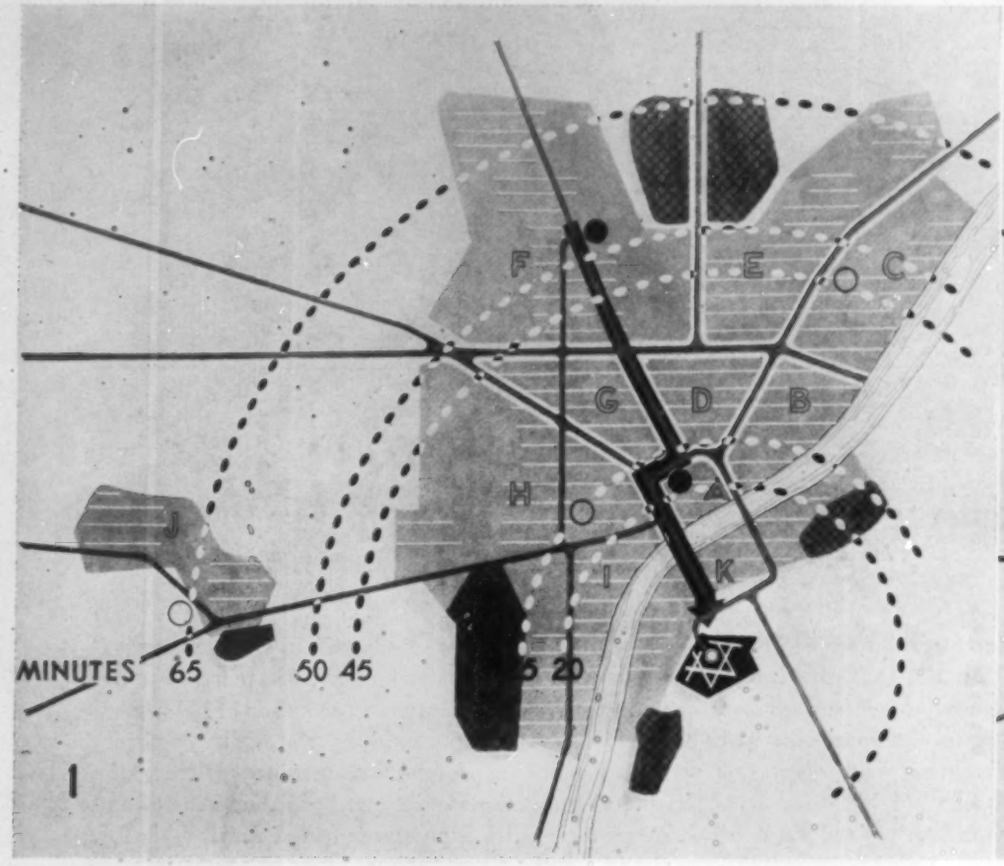
Architectural education can, however, only begin in the schools; it is a life-time pursuit. No school can turn out full-fledged, competent architects in the few years allotted to formal education. Dean Hudnut's survey of "what courses should be taught in the architectural schools" produced a list long enough to take the student a Methuselah's lifetime.

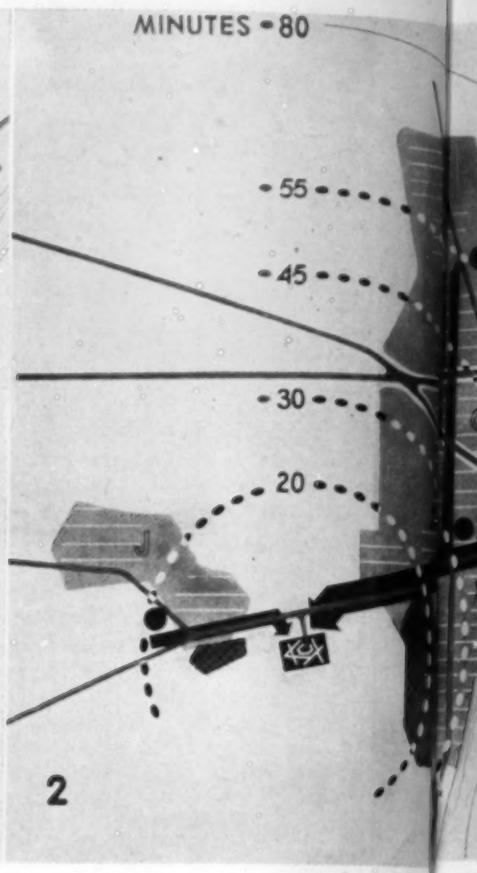
The problem of the school is therefore to orient the student for a lifetime of continuous study and development. The schools' prime objective thus should be to inspire, encourage and instruct the student in the arts of analytical and creative thinking. It can inform him of the nature of the problems to be solved, the methods of attacking and analyzing the problems, the advantages and disadvantages of previous and current solutions, and the tools, materials and techniques at hand for his creative imagination to command. The school can inculcate logical methods of thought, research and expression, and can impart a basic working knowledge of the arts and sciences the architect must employ, the means to his ends. It can supply the beginnings of a background of vicarious experience as a point of departure for better solutions. It can develop a thirst for knowledge, an enthusiasm for experiment, and a critical discrimination and judgment. It can encourage, if not impart, a creative imagination tempered only by analytical logic. It can train the young architect in the clear, graphic expression of ideas, purposes and means. It should also train him in the art of convincing verbal presentation.

A big order! And one not simple or easy to fill in a few years — yet not impossible. However, only by keeping these objectives in mind and in balance can the young architect's introduction to his profession be most effective. Danger lies in overemphasis on one or another component in this formative period. With a firm foundation of essential attitudes, skills, knowledge and methods of work, the young architect can continue his self-education successfully along the lines of his natural (or acquired) abilities or interests, fitting himself to take his place on the team which "creates man's environment." It is a process he is destined to follow from the college to the grave.

Kenneth K. Stowell

EDITOR





LEGEND

- Community Ticket Office
- Airport Bus Routes
- Industrial Areas
- Population Growth Estimated by 1960
- Present Population Concentration
- Major Airport — Outlying Location
- Major Airport — Central Location
- Private Flying Field
- Intermediate Airport
- Private Flying Fields

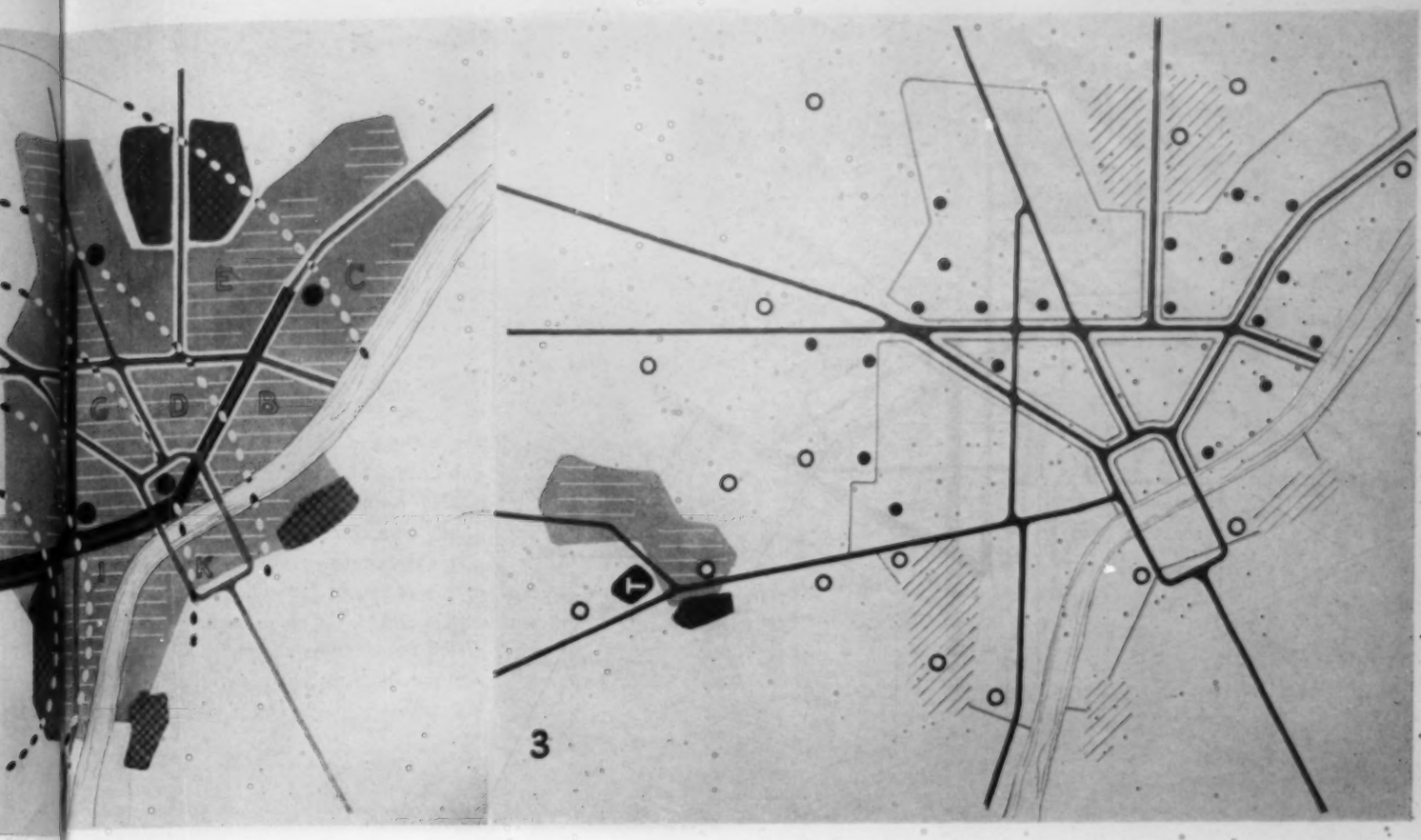
ESTABLISHIN(A

TYPICAL AIPRORT PLANNING SURVEY MAPS

1. ***Driving Time. Major Airport. Central Location.*** *Map indicates that approximately 65 per cent of the air passengers will have a driving time of 45 minutes or less to an airport located directly across the river from the central business and hotel district. A central ticket office in area "A" and another in "F", with ground transportation between these and the airport will amply serve. Public attendance expected, 800,000 per year by 1960*

2. ***Driving Time. Major Airport. Outlying Location.*** *Map indicates that only approximately 40 per cent of all air passengers will have a driving time of 45 minutes or less to an airport located 20 miles west of the center of the city. In this case ticket offices are located at centers in areas "A", "C", "F", and "H" with ground transportation from each to the airport. Public attendance at this port would be chiefly in good driving weather, which in the northern states might be limited to less than 250 days per year and be further limited to summer evenings, weekends and holidays because of distance. Yearly attendance on this basis is expected to reach 300,000 by 1960 if good spectator facilities are provided*

3. *Map indicating the location of all airports in the region. The private flying field chosen for illustration is one of several serving area "J" with its population of 70,000 in 1950 and 90,000 in 1960. Area "J" has a college enrollment of approximately 20,000 students at present. Approximately 100 planes would be based at this point*



AN AIRPORT PLANNING PROGRAM

By Smith, Hinchman & Grylls, Inc.,

Architects and Engineers

In a previous article entitled "Airport Programming Analyzed,"* we said: "Any competent airport survey sets up a master plan, not all of which can be built at once. The time factor is as important as the space pattern. An orderly sequence of development has advantages too obvious to require discussion."

Further, it should be said that a competent airport survey will provide the basic data necessary to establish an Airport Planning Program for any site within the region covered by the survey.

A program based on the needs of aircraft operations, maintenance and storage, as well as those of cargo, mail, passenger, private flier and spectator potential, should be established to meet the growing needs as set up in the survey and report. Only in this way can an economically sound base be laid for both present and future operations at any airport.

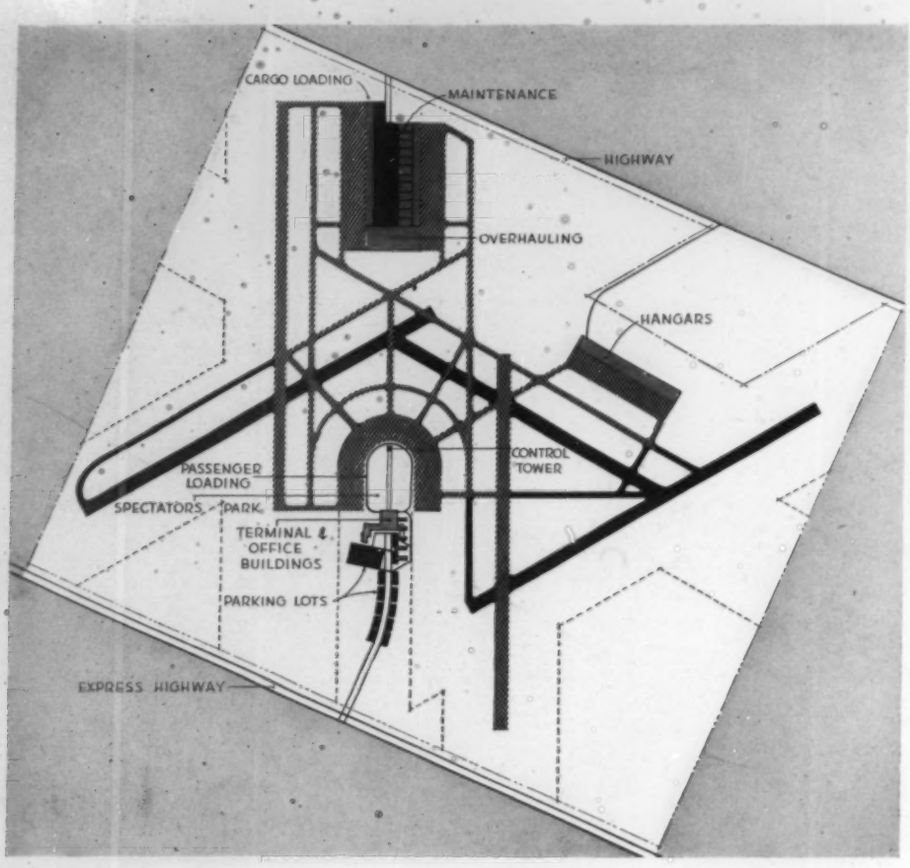
The tendency in the past has been to lay principal stress on the engineering factors of airport planning with no program established to guide the engineer and architect in the long range requirements of an airport. Previously built airports have been used as guides to space-use patterns. These examples no longer serve that purpose.

No attempt is made in this article to deal with the everyday engineering encountered in airport design. These aspects have been treated at great length in handbooks, texts, and many publications.

Good engineering design of the paving, drainage, lighting and buildings will result in economical construction and lessen the annual maintenance costs. But the best engineering of these items will not make an ineffective layout effective, nor will the most beautiful buildings accommodate the efficient organization of the various functions to be performed therein unless the proper relationships between these functions is incorporated in the original plan.

The office of an architect-engineer staffed with personnel qualified to set up this program acts as the

* *Architectural Record*, April, 1947, pages 103–108.



The windrose analysis for each of the two major airport sites indicates that an open parallel 60° runway pattern will provide 99 per cent wind coverage and a field capacity of 120 plane movements per hour in contact operations. The survey indicates 50 plane movements per peak hour in 1950 and 90 in 1960. It is expected that with the successful development of swivel landing gear only two runways will be required to provide the necessary wind coverage at this airport. As indicated only two of the five runways shown would be required at such time as swivel landing gear is applied to all planes

owner's representative in the formative stages of each site development. Preliminary plans based on this program should be used in all lease negotiations.

Basic survey and report data to be used in the planning program should include:

1. **Air passenger potential**
2. **Air cargo potential**
3. **Air mail potential**
4. **Student flier potential**
5. **Private plane owner potential**
6. **Meteorological data**
7. **Market analysis**
8. **Land use**

Based on this data, supplemented by detail surveys and collaboration with designated airport authorities and the airline or fixed base operators, the development of an airport planning program can be accomplished.

SCOPE OF AIR OPERATIONS

The scope of air operations at any major scheduled service airport is determined primarily by the air passenger, mail and cargo potential and the extent of maintenance required to meet these needs. Similarly, the scope of air operations for the smaller or private flying and intermediate fields is determined by the volume of private flying, charter service and airline feeder service and the extent of ground service and storage necessary to meet these needs.

At major airports where provision must be made for scheduled passenger service ranging in distances from cross-country and international to the short feeder line distances, as well as mail and cargo service, the volume of peak hour and peak day plane movements will be determined by the type and capacity of planes used to develop schedules necessary to meet this volume of air travel.

At the private fields, provision must be made to operate and hangar the smaller planes necessary to meet the needs of private plane owner, student flier and charter service assigned to this field in the survey as well as ground service facilities for these aircraft.

The intermediate fields will require similar provisions as well as those necessary to meet the needs of feeder or local airlines operations and service.

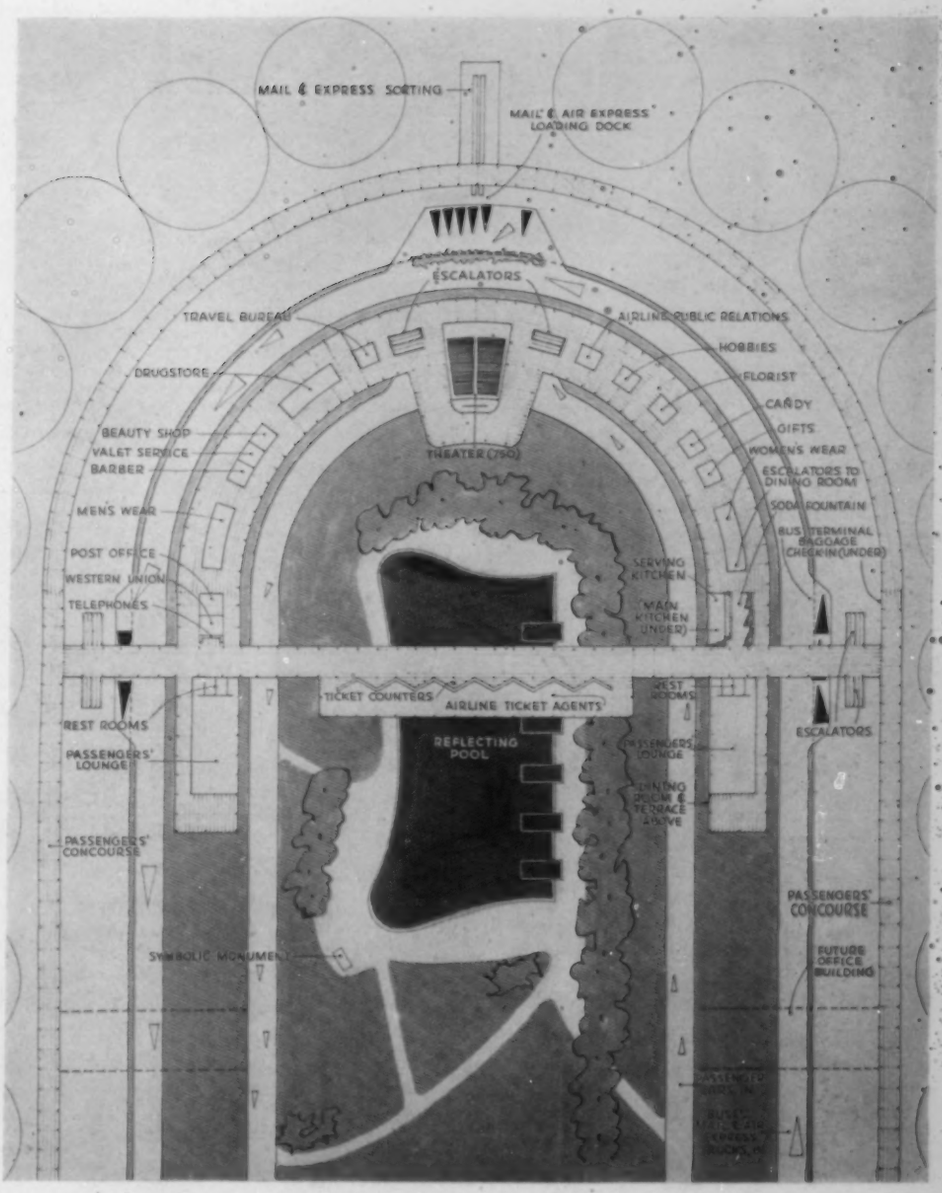
RUNWAYS AND LANDING STRIPS

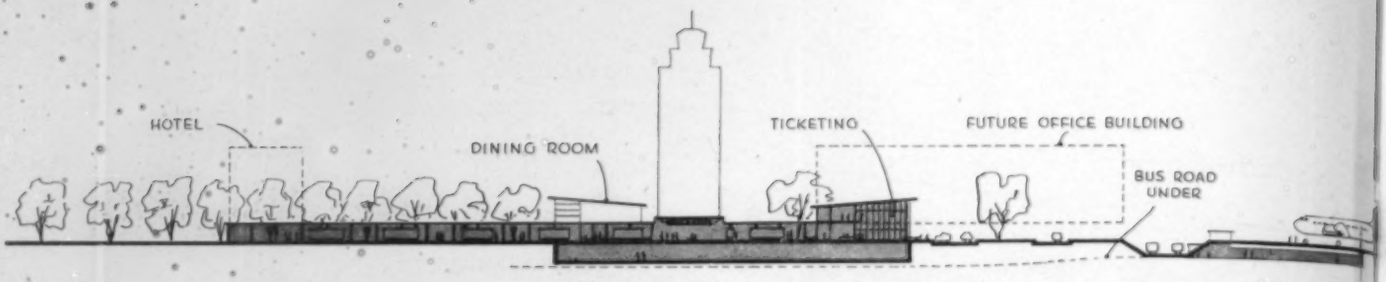
The wind rose has been and still is a prime factor in determining the alignment of runways and landing strips. However, there are several points which merit thorough analysis in using the wind rose information. First of all, an airport wind rose is an item of composite nature and should, if possible, be broken down to its velocity components and an analysis made of those velocities above 10 miles per hour. It is the high winds which should be used in determining the runway layout for an exclusive transport terminal or for a field which is to be used by both transport and personal flying.

Cross wind landing gear, which is now nearing a workable stage of development, when finally adopted for use

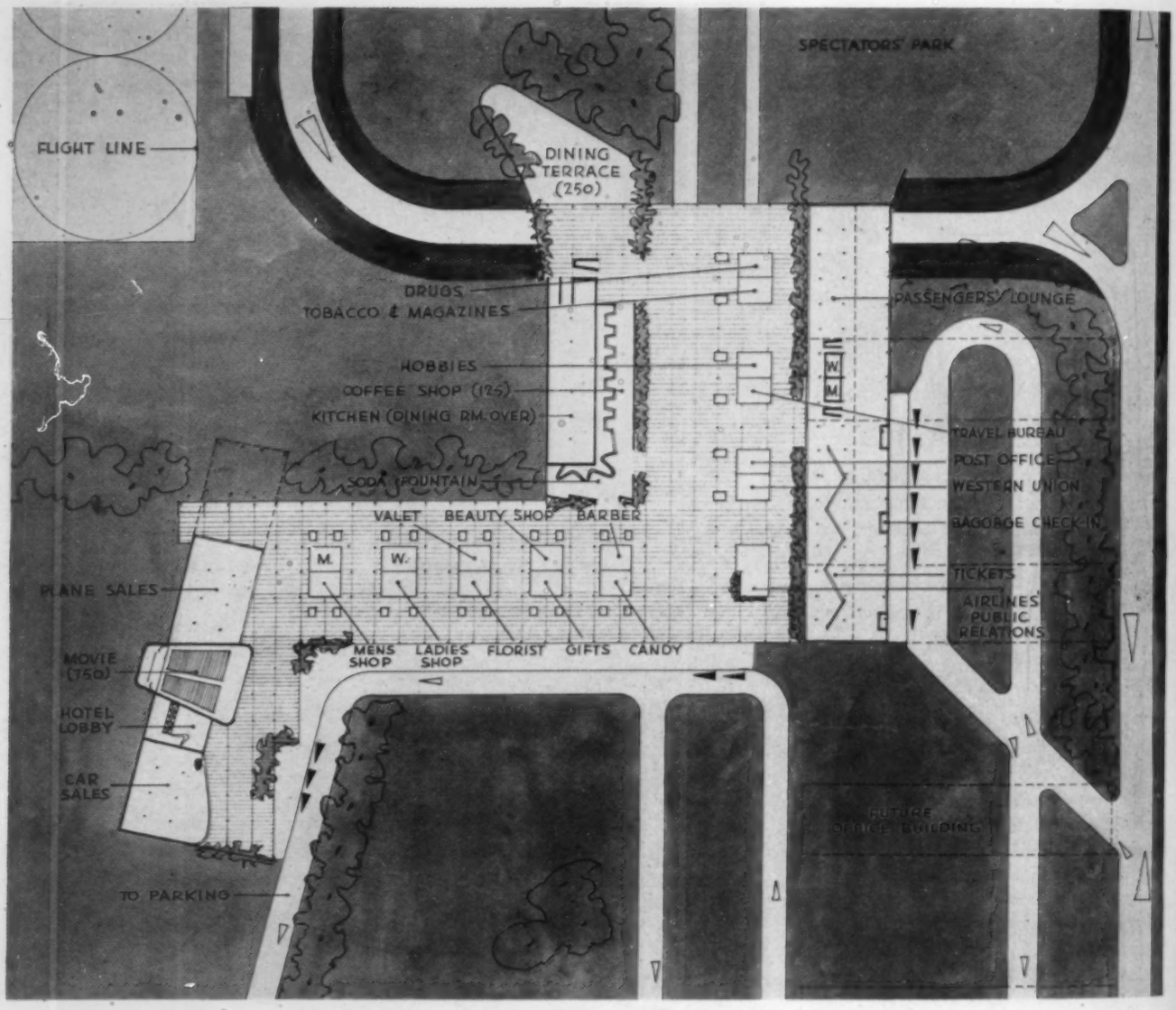
Terminal Plan — Major Airport — Central Location

At this site, considering the shorter driving time, it is entirely reasonable to expect that as many as 50 per cent of the region's air passengers may be ticketed at the airport terminal and that this same percentage may arrive in private cars or taxis, the remainder being ticketed at one of the city ticket offices and arriving in airline limousines or buses. The growth in air passenger potential from 1950 to 1960 requires the terminal area development to be flexible and if necessary expandable to meet growth and the changing needs. For example: the first stage of development in 1950 will require 14 plane spots and all weather loading from second level and 22 in 1960. All passenger handling, plane service and other ramp operations are on a consolidated operations basis. The enplaning passenger leaves his car or airline limousine at road level and point of baggage check-in and proceeds by escalator to second level ticketing, lounges, rest rooms, or directly to gate of plane departure. At this point he is checked in by a ticket agent and boards his plane by way of an all weather gangway. Guests of air passengers have access to air passenger lounge. The public has a separate entrance and a spectators' promenade at second level in common with shopping and recreational facilities



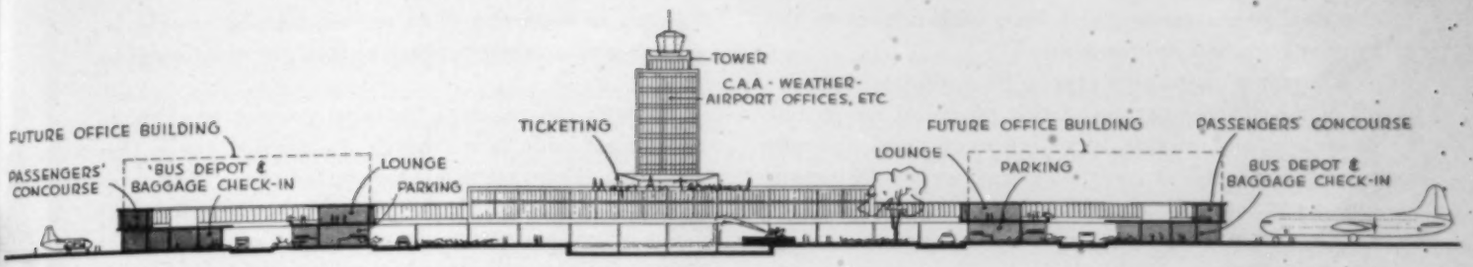


Section through terminal building



Terminal Plan — Major Airport — Outlying Location

With 60 per cent of the air passengers in the region having a driving time of over 45 minutes it can be safely assumed that at least 75 per cent of these passengers will arrive, pre-ticketed, by airline bus or limousine. These passengers will go directly to their plane gates. The remaining passengers arriving in private cars, public bus or taxi will go to the ticket office and from there by an airport bus which serves all plane gates. A major airport in this location, we feel, will be a fair weather port as far as public attendance is concerned. For that reason the scheme illustrated indicates a spectators' park reached by passing through a shopping arcade



Section through Terminal Building at an airport centrally located

on all planes in scheduled, non-scheduled, and private flying, will require approximately one-third the area now needed to achieve the necessary wind coverage in airport planning. Full cognizance should be taken of this possibility in the development of a runway pattern for the ultimate or master plan.

While the wind rose analysis and the obstruction map will determine the alignment of runways and landing strips, their relative positions in the layout and their lateral positions will be determined by the ground traffic patterns. A study of the volume and the types of operations with respect to wind directions and frequencies will show which ground traffic pattern will be the most efficient compromise with the location of the terminal and building areas. Construction costs should not be the only criterion in developing the landing area design because the capital expenditure is a non-recurring expense, but excessive ground time is an ever increasing item of expense to operators.

TIME IS MONEY

Minutes can be added or subtracted from the plane movement time at this point of design. The importance of providing an efficient airport plan is emphasized by consideration of the cost of one additional minute of taxiing or waiting time based on an operating cost of $120 per hour, $90 per hour and $6 per hour, which are comparable to the cost of operating four-engine transport, twin-engine transport and light aircraft. The number and position of taxiways will have an important effect on not only the cost of using the airport in excessive ground time, but also in the capacity of the airport. The *position* of taxiways is most important in the case of airports anticipating a large volume of transport type operations while the *number* of taxiways or taxilanes is most important in effectuating the capacity of a landing strip in light plane operations. This is particularly true where the ultimate expected volume of occupancy anticipates periods of use where simultaneous parallel landing will have to be permitted in order to reduce plane circling time during peak periods.

One of the most difficult problems facing the air transport industry is that of retaining airport capacities during instrument conditions up to the capacity in effect during contact conditions. Air navigation facilities designed to assist landings and take-offs under instrument conditions for the most part operate at frequencies which are influenced by moving or stationary objects in the field of the instrument. The planning program should include the installation of such equipment, especially at those airports anticipating either scheduled operations or an appreciable volume of cargo or other non-scheduled movements. This places additional limitations in planning, particularly in the location of buildings, including hangars, and the position of highways, railroads and

Perspective of Terminal Building at an outlying airport

electrical power transmission lines with respect to the runway ends and approach areas.

Whether a major airport is to be a terminal base for *all* of the airline operators (with provision for all line inspection and repairs, including motor and airframe overhaul, as well as hangar storage) or would include only a *portion* of these, depends upon the location of the port in relation to the scheduled air routes of the airlines using the port.

Resolving the peak-hour plane movements into plane positions on the ramp involves the analysis of the types of planes operating and the length of time and facilities required to service these ships. **Due consideration must be given to the advantages of consolidated ramp service and its consequent savings in personnel and equipment.**

PASSENGER TRAFFIC CONTROL

The method of handling on and off passengers and their baggage at all major airports (including line stops with low passenger potential and those with a high passenger potential as well as terminal ports, where the volume of transfer passengers becomes an important factor) will be determined by the distribution of this air passenger volume in the communities served by the airport. This will also be a factor in the determination of ground transportation and the ultimate location of airline ticket offices in relation to these community centers.

The method of passenger handling will determine to a large extent the number of passengers arriving at the airport pre-ticketed and the consequent extent of passenger facilities to be provided. At an outlying port where driving time is excessive and which is served by community ticket offices, passenger facilities may be reduced to a minimum. The same is true of a landing field which serves only as a ground to air transfer point. Public interest at such a port is at a minimum and will require a build-up of supplementary non-air facilities to encourage attendance and revenue from this source.

Whether the major airport has a central or an outlying location, all-weather protection for the passenger should be provided from point of ticketing to plane. Second level loading is favorably considered by most airlines, but the problem of all-weather protection from here to the plane remains unsolved chiefly because of the varying positions of plane loading doors and floor levels.

Segregation of air passengers from the general public is desirable to the extent that it will permit a free flow of passenger traffic from airline lounges and ticket offices to their planes and still provide supplementary facilities such as dining rooms, shops, Western Union, etc., which are easily accessible and visible to passenger and public alike.

The air passenger arriving at the terminal should be able to weigh and check in his baggage at the point of leaving the limousine, taxi or airline bus. For the convenience of the air passenger driving his own car, provision might be made to have an attendant take his car from the point of baggage check-in to a parking area. Passengers departing from the air terminal should be able to pick up their baggage as their car is delivered to them.

Transfer passengers, as usual at present, would have no contact with their baggage at transfer points. Distribution of baggage would be handled to and from three points on the ramp: (1) point of entry and check-in; (2) point of exit and check-out and from a central transfer point by light motor trucks circulating free of passengers; and (3) terminal area service traffic.

At line stops and terminal airports provision should be made for airline public relations, ticket agents, airline communications and ramp offices for both plane servicing and passenger check-in as well as the general office space required by the airlines. Consolidation of ticketing and baggage handling now being considered by the airlines operating from the larger ports will result in a considerable saving of space as well as airline personnel.

OFFICES AND SUPPORTING FACILITIES

The flight control tower and office should be centrally located to afford an unobstructed view of the field and ramp. Space will be determined by CAA on the basis of volume of operations at the airport, as will be the general office space required by CAA.

Weather Bureau space should be provided as required. This space and CAA offices may be in isolated structures apart from the terminal building.

Post office and air express space requirements will be based on the volume established by the survey and collaboration with the Postal Authorities and the Air Express Company. This space should be located along the ramp in a position central to the ultimate number of plane positions.

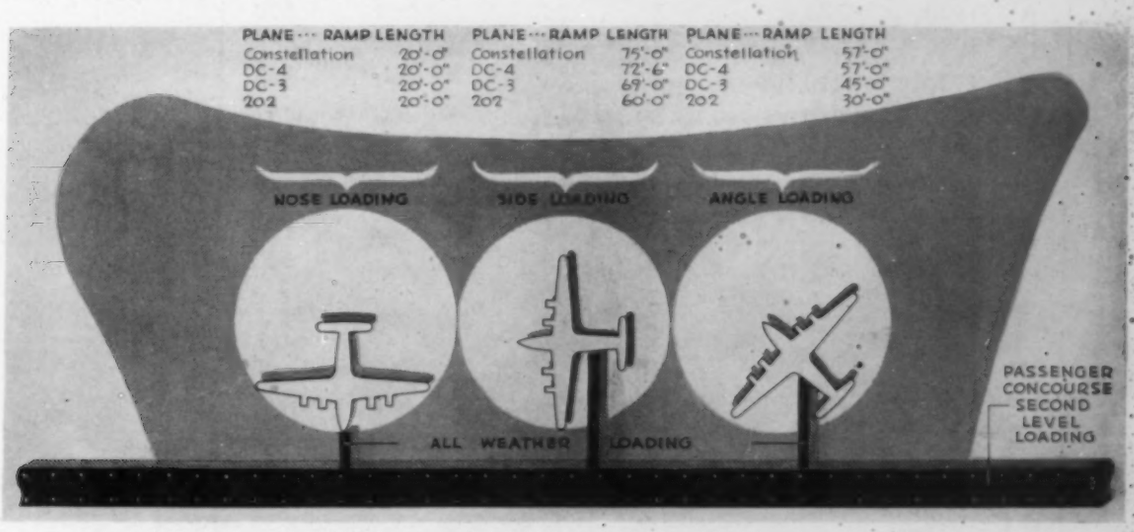
Many supporting facilities necessary to the maintenance of field, ramp and terminal area service must be provided in the terminal area of a major airport, such as: space for a first aid station; ambulance and fire and crash trucks at central position on the ramp; kitchen service for meals aloft as well as for public dining rooms and coffee shop. Provision must be made for locker rooms and cafeteria service for terminal area employees, offices for the airport director and staff, and in some instances, offices for the regional airport authority.

The patterns of population distribution and transportation in relation to the airport site have a definite bearing on the number and extent of supplementary non-air facilities to be provided at any airport for the convenience and recreation of public, passengers, and private fliers. The population distribution as established in the report, when considered in relation to their driving, recreational and shopping habits will determine the kind and the extent of these facilities at the particular airport under consideration. A large per cent of the airport's revenue will be realized from this source and the kind and quality of these services must be carefully approximated to insure their successful operation. The location of these facilities in relation to each other and to the passenger handling program must be carefully

studied, bearing in mind the desirability of passenger circulation segregation without isolating these facilities which must be available to passenger and public alike. The volume of business done by these facilities at a major port will be large and the careful selection of competent operators for each is of utmost importance to a continued high standard overall operation.

The airport plan as a whole, and in its many details of air and non-air operations, should fit into the projected land use patterns of the community with a minimum of inconvenience to these operations and become an integral part of the region's transportation system.

The balance sheet of land costs, land development costs, financing charges, maintenance costs, and operational costs, together with the revenues to be derived from all sources will determine the relative advantages of different sites under consideration and when considered with the operational aspects of each site will provide a basis for the selection and development of a sound "Airport Planning Program" for each stage of development.



All weather passenger loading may soon be considered a must at major air terminals and at line stops along routes served by the larger ships. Its general acceptance will be dependent upon its flexibility, cost of construction and simplicity of operation. Nose loading forward of the inboard nacelle affords the shortest distance for a covered gangway between plane and second level loading. All weather loading at an outlying air terminal, as shown on page 94, might consist of passenger concourses under the ramp from the bus station to a hydraulic lift terminating at the plane entrance

THE EXAMPLE ILLUSTRATED

To illustrate some of the factors contributing to the preparation of an "Airport Planning Program" we assume that a survey and report have been completed for a region some sixty miles in diameter and that full authority and responsibility for the development, operation, financing and management has been vested in a Metropolitan Airport Authority. This area, like many of our metropolitan centers of industry and business, is divided by a navigable river which is an important factor in the transportation of raw materials and finished manufactured products. The total population is at present 3,000,000 and is expected to reach 3,500,000 by 1960.

The report indicates a need for one major, 14 intermediate and 22 private-flying airports by 1960. Passenger distribution into areas of origin and termination is generally the resultant of population distribution by income, the volume of industry, and the travel habits of each. These can well be defined, as in illustrations No. 1 and 2, by major cross-city expressways. The areas shown are generally larger than any of the elementary junior or high school communities which are often used as a basis for planning the community life of a city, and represent a combination of these school communities defined by the expressway and transportation system of a metropolitan area.

The following data is then taken from the report to establish a close approximation of the air needs and the contributing non-air needs of the regional airports.

For scheduled passenger service the report indicates 340 plane movements per day in 1950 and 580 in 1960. For cargo service, 25 plane movements per day are indi-

cated for 1950 and 60 for 1960. (See tabulation below.)

The economic characteristics of school communities, such as income, available shopping money and shopping habits, when combined in areas designated as passenger distribution areas, will indicate the dollar volume from which non-air revenue is to be drawn. This volume when considered in relation to the driving time to the airport and the driving habits of the area will indicate the revenue dollars in sales to be expected from the various concessions and services at specific airport sites.

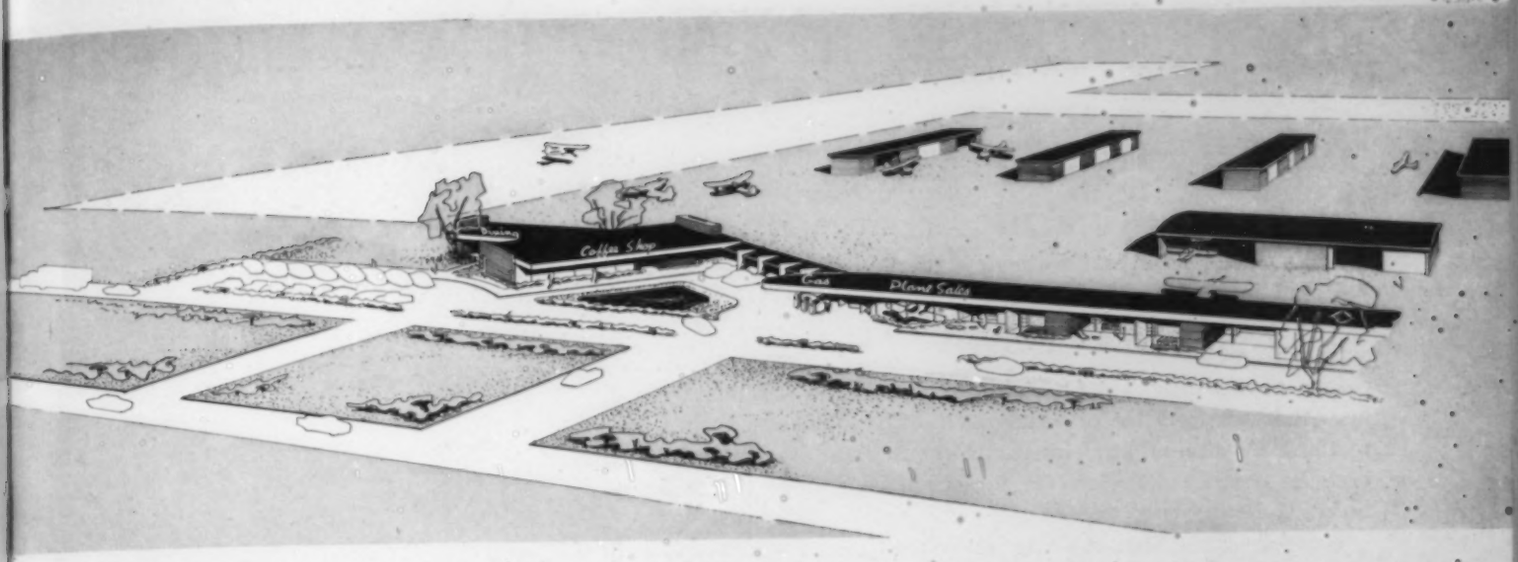
Analysis of all air requirements, collaboration with the operators and airport authorities will likewise establish space use and functions for all areas including field and buildings at each stage of development.

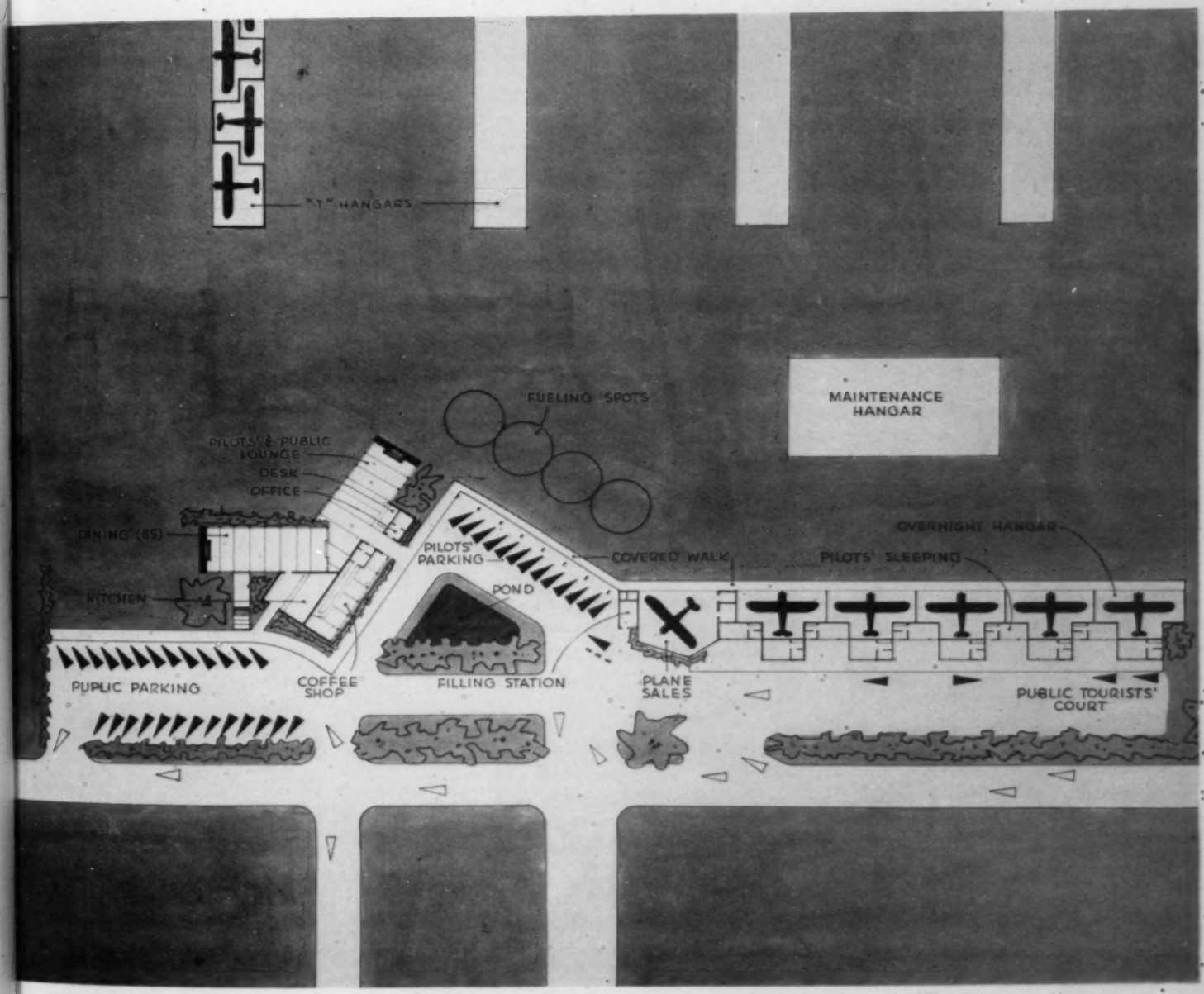
The combined needs of air and non-air operations translated into area requirements in terms of square feet and development costs, then becomes a part of the region's financial program.

Area		Population	High School Communities	Air Passengers	Private & Rental Planes	Pilots
A	1950	370,000	7	350,000	250	500
	1960	325,000	7	650,000	450	1,000
B	1950	210,000	4	60,000	320	650
	1960	240,000	5	150,000	400	800
C	1950	110,000	2	250,000	1,550	3,100
	1960	160,000	3	800,000	1,850	3,700
D	1950	215,000	4	30,000	120	260
	1960	257,000	5	75,000	175	350
E	1950	90,000	2	135,000	80	150
	1960	175,000	3	300,000	150	300
F	1950	120,000	3	200,000	760	1,600
	1960	180,000	4	750,000	825	1,950
G	1950	350,000	7	350,000	2,200	4,600
	1960	375,000	8	900,000	2,500	5,450
H	1950	165,000	3	50,000	320	900
	1960	200,000	4	125,000	400	1,250
I	1950	190,000	4	85,000	100	260
	1960	220,000	4	270,000	150	375
J	1950	70,000	2	80,000	320	800
	1960	90,000	2	200,000	400	1,075
K	1950	70,000	2	20,000	80	150
	1960	80,000	2	80,000	100	200
Outlying Area						
	1950	1,040,000	20	390,000	700	1,500
	1960	1,198,000	24	700,000	900	1,900
Total						
	1950	3,000,000		2,000,000	6,800	1,500
	1960	3,500,000		5,000,000	8,300	18,350
Air Mail						
	1950	8,400 Tons				
	1960	12,000 Tons				
Air cargo						
	1950	37,000 Tons				
	1960	92,000 Tons				

Private Flying Field

Provision is made for complete maintenance and storage of 100 small planes at this post as well as classrooms for student fliers, overnight accommodations for transient fliers and airplane sales. To provide better facilities for the private flier and ensure successful operation at the field, a restaurant lounge and overnight facilities are located adjacent to the highway. This is also a means of creating public interest in the airport


Coffee Shop
Gas
Plant Sales


"T" HANGARS
MAINTENANCE HANGAR
FUELING SPOTS
PILOTS' & PUBLIC LOUNGE
DESK
OFFICE
DINING (85)
KITCHEN
PILOTS' PARKING
COVERED WALK
POND
OVERNIGHT HANGAR
PILOTS' SLEEPING
PUBLIC PARKING
COFFEE SHOP
FILLING STATION
PLANE SALES
PUBLIC TOURISTS' COURT

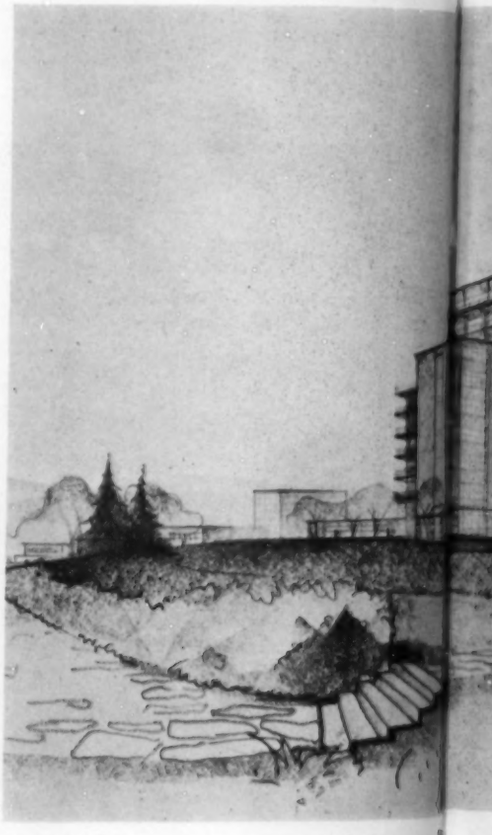
PRIVATE FIRMS PREDOMINATE IN V. A. HOSPITA

RECENT decision by the Veterans' Administration to use its own staff in 1948 for designing 15 hospitals has led apparently to some misapprehensions regarding continued participation by private architect-engineer firms in the current VA program. There are rumors that a great many projects, still in the preliminary design stage, will be withdrawn from the present system of handling and turned over to the VA's internal staff for completion. Official spokesman for all agencies concerned declare, at present writing, that this is by no means to be the case.

It is important, first of all, to understand that the 15 hospitals in the 1948 Program, under an appropriation of some $230,000,000, are no part of the 73 projects in the current program for which Congress has voted approximately $730,000,000. Furthermore, a brief review of the current program's operations and status may be helpful in clearing up misunderstandings regarding the future.

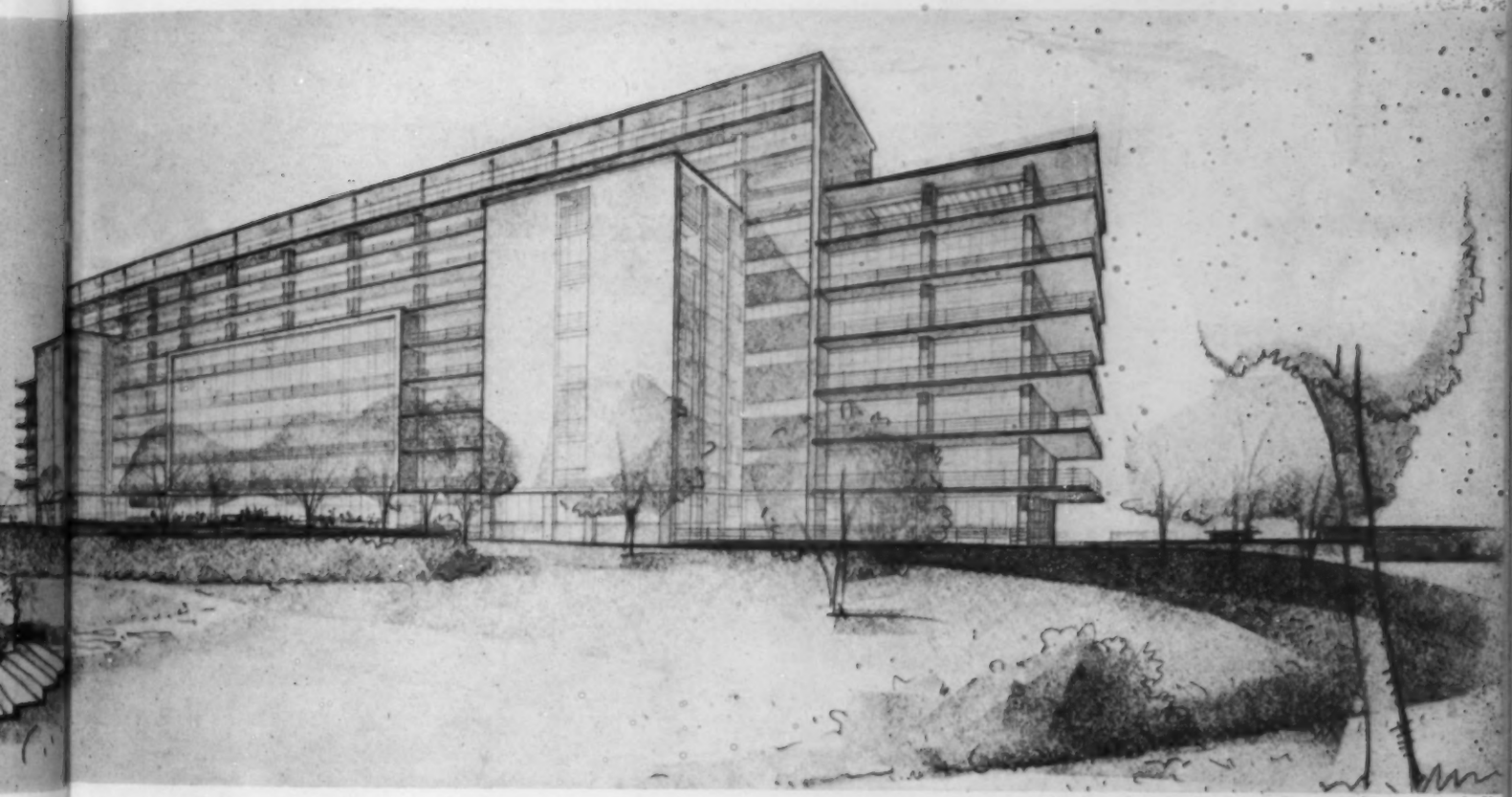
Quoting from a recent statement by General Bradley: "From the outset it was evident that the program would greatly outstrip the capacities of the VA's own architect-engineer staff. Because the Army Corps of Engineers was already organized in field and division offices throughout the country, we elected to use its facilities for design and construction. Under this arrangement the Engineers are provided by the VA with detailed criteria for projects in various localities. Contracts are then awarded by the Engineers to private firms, with suitable past experience and performance, and data is provided for the preparation of preliminary designs. These are cleared by the VA for conformity to criteria and returned to the private firms for development as working drawings."

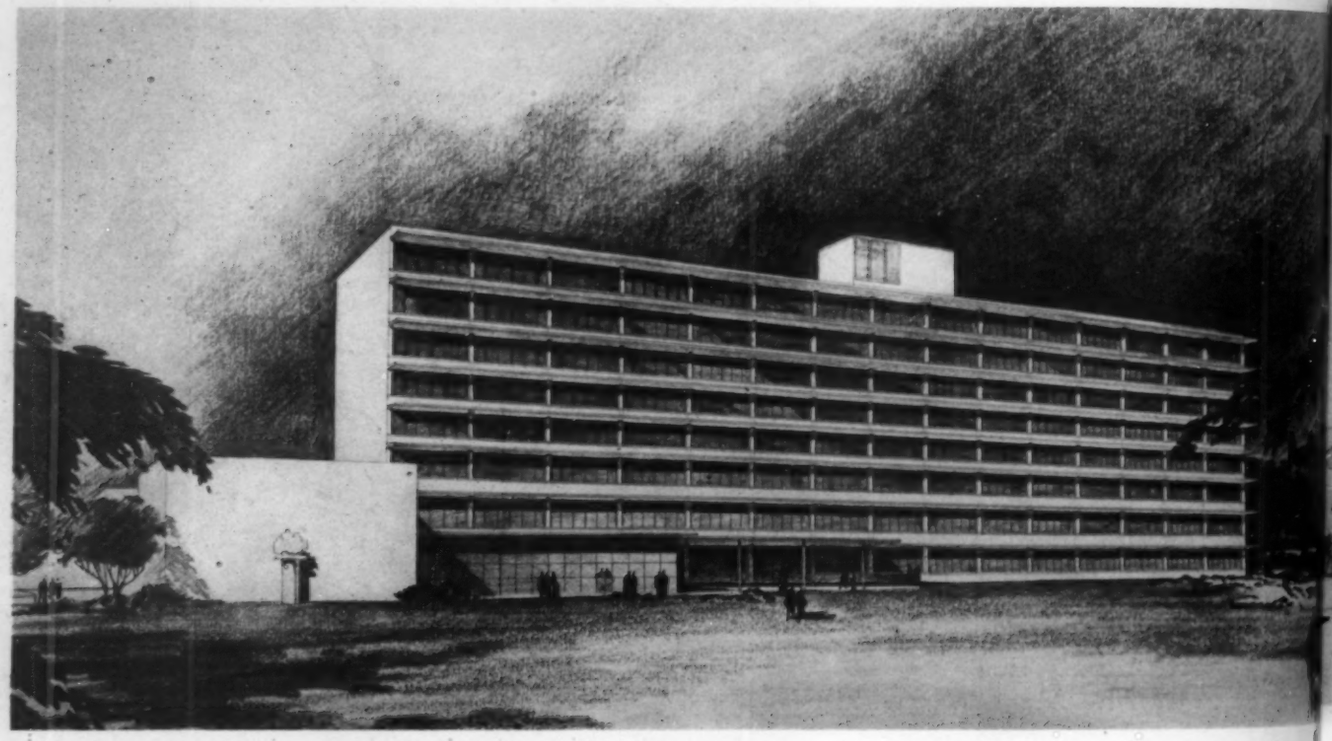
Nine hospitals in the current program are now under construction contracts. Five of these were designed by the VA's staff; four, by private firms (for the detailed treatment of one, Fort Hamilton Hospital at Brooklyn, N. Y., by Skidmore, Owings & Merrill, see ARCHITECTURAL RECORD, June 1947, pp. 114–123). A second group of 15 projects will be advertised for construction bids by the Corps of Engineers until December 15th of this year. Every one of this group, to go forward in 1948, was designed by a private firm. The balance of the 73 projects are largely still in preliminary stages of design. In an effort to pare at least $100,000,000 of estimated excess above appropriations, due to inflated building costs, these will be restudied for elimination of "nice but not necessary" staff and entertainment spaces. There will be no savings, however, "at the expense of accommodations and comfort for patients, or of modernity and efficiency in operating rooms, laboratories, and contingent facilities." Moreover it is officially declared that, with the possible exception of two or three projects for which sites have not yet been determined, the current program will continue as at present in the hands of the Corps of Engineers and private firms. Use of the VA's staff on the future projects is due entirely to the satisfactory operation of the current system in bringing the entire program into scope for this staff to be utilized. It is stated that its number, previously reduced to under 300, will not be increased for the purpose, and if there is evidence that even this share of the work is beyond its capacity, a number of the new projects may revert to the current system of handling.



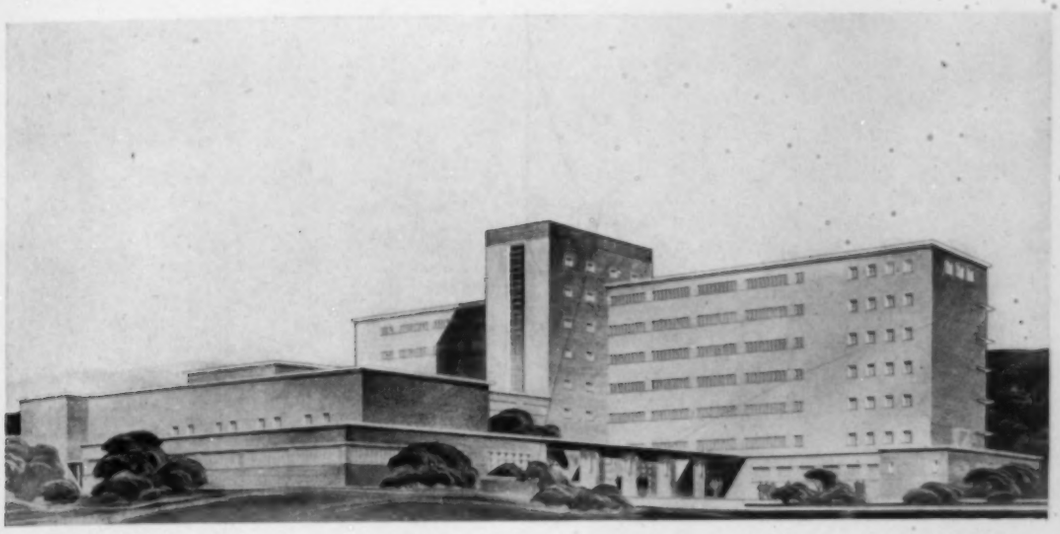
Among the 15 projects in the current program ready for construction is the 200-bed general medical hospital (top cut) at Iron Mountain, Mich. Architects-Engineers are Fugard, Olsen, Urbain & Neiler. Another is the 200-bed g. m. hospital at Wilkes-Barre, Pa. (directly above); Kelly and Gruzen, Isadore Rosenfeld, Architects-Engineers. A third is the 200-bed g. m. project for Fort Wayne, Ind. (right), by Giffels and Vallet, Inc., and A. M. Straus

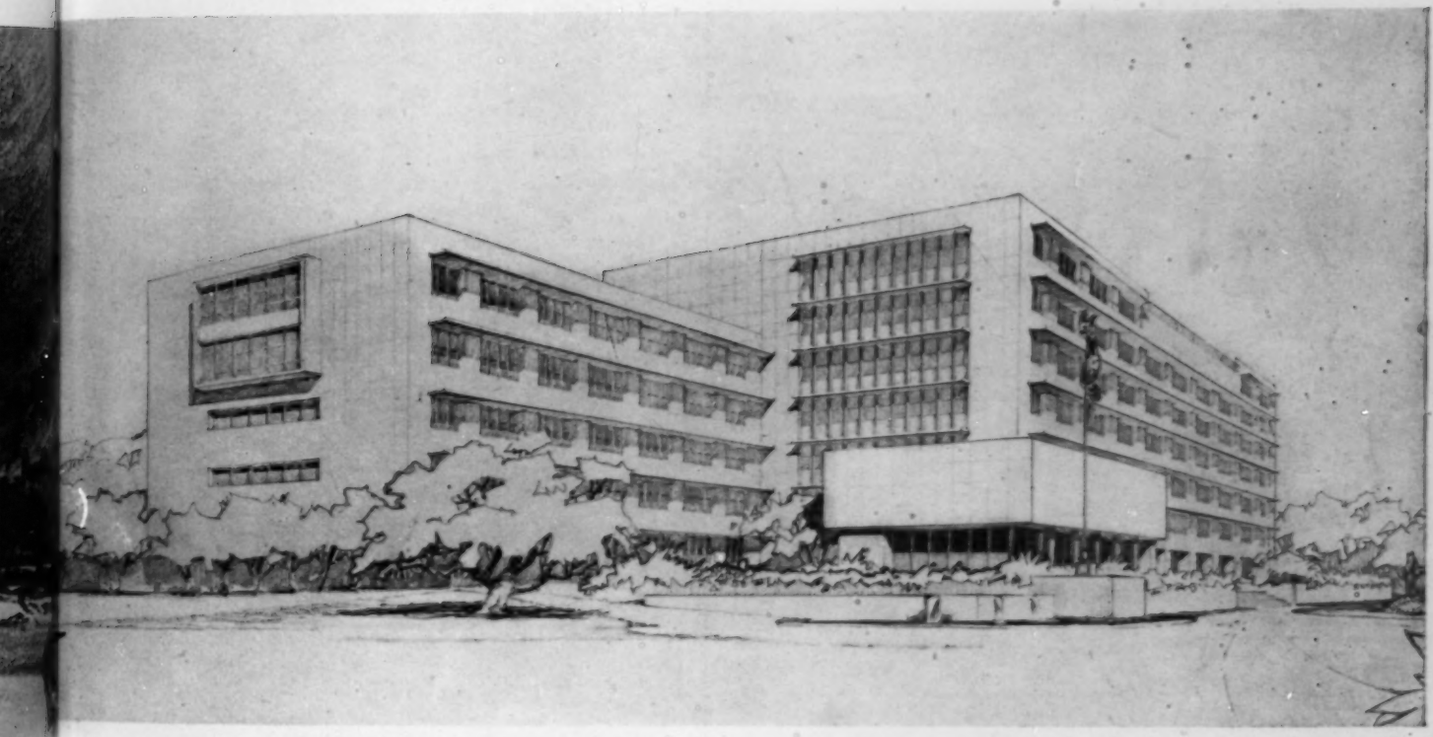
PROGRAM

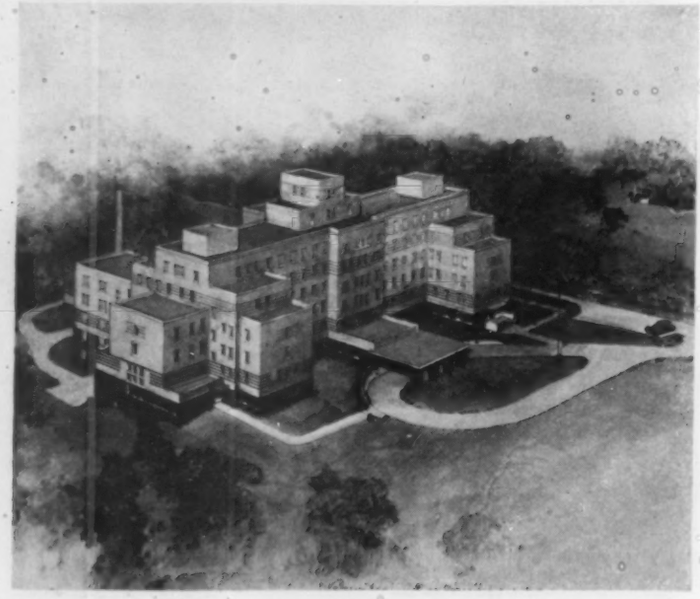


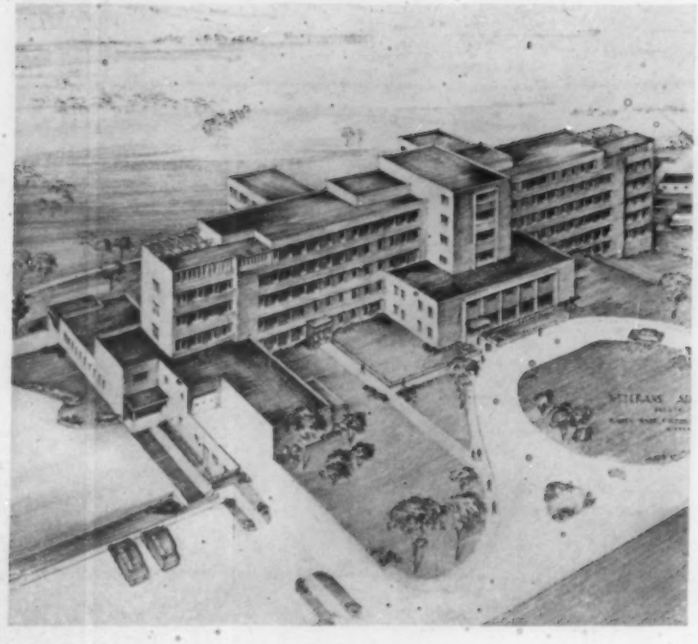


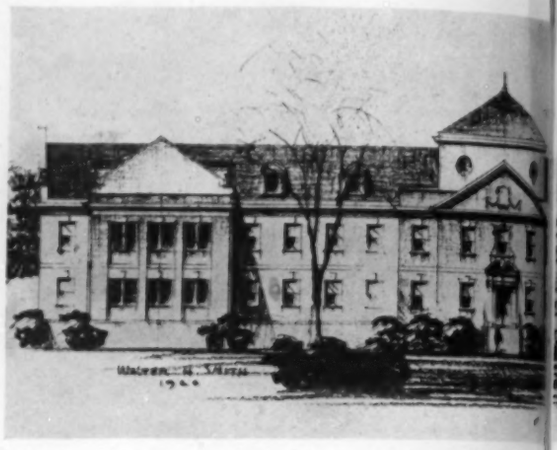
Three projects on these pages are in the group of 15 on which construction bids are now being taken; the 450-bed general medical hospital for Shreveport, La., is by Neild & Somdal (at top of this page). On page opposite, at top, is the 200-bed general medical project for Altoona, Pa.; Marlier, Wolfe & Johnstone, Architects; Button, Sterling & McLean, Associate Architects. At bottom of the page opposite is the 250-bed general medical project for Big Springs, Texas, Wyatt C. Hedrich, Architect-Engineer. Directly above on this page is a 250-bed tuberculosis hospital for Americus, Ga., by Burge and Stevens and Associates, and J. R. Wilkinson. This is one of the group in the current program requiring restudy. Middle cut on the page opposite shows the 250-bed general medical project at Fresno, Calif., for which construction contracts were let on August 19th. Masten & Hurd and Huber & Knapik were the Architects-Engineers



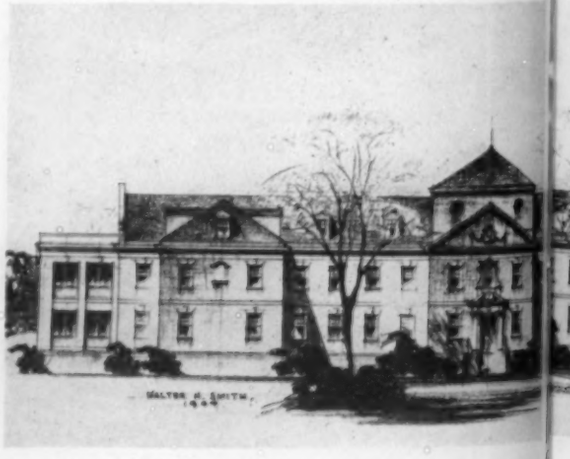




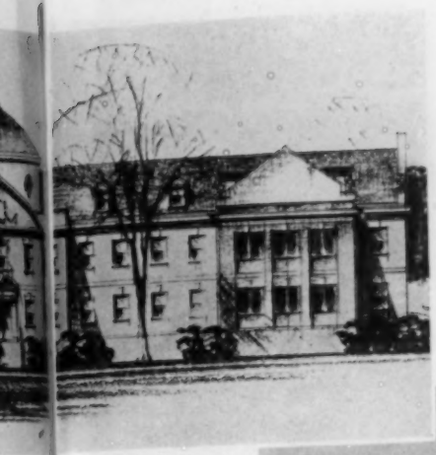


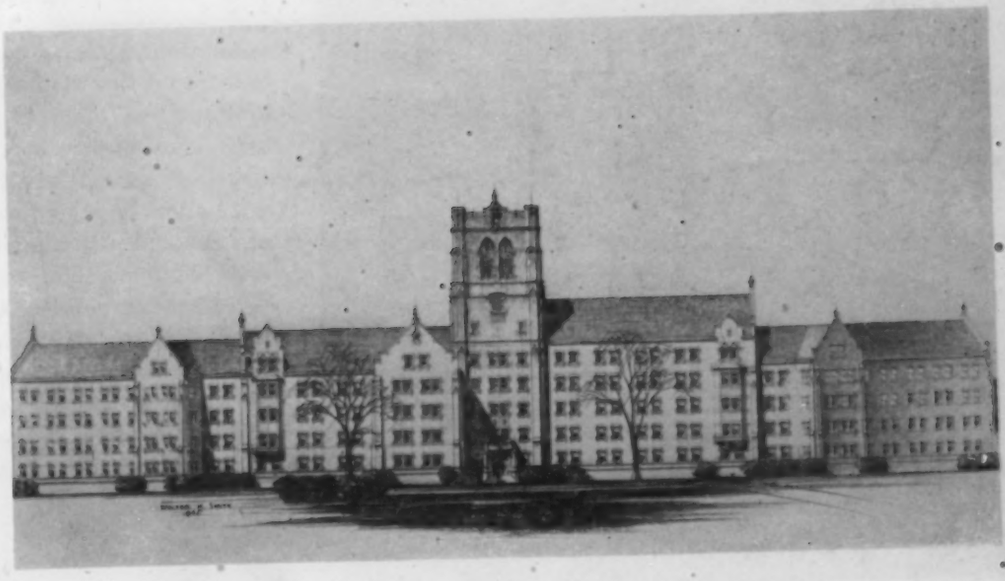


At left, top: 500-bed g. m. hospital for Little Rock, Ark.; Erhart, Eichenbaum & Rauch, Brueggeman, Swaim & Allen, Architects-Engineers; Edgar Martin, Consulting Architect. At left, middle: 200-bed g. m. for Beckley, W. Va.; Tucker & Silling, Architects. At left, bottom: 200-bed g. m. for Duluth, Minn.; Magney, Tusler & Setter, Architects-Engineers. First two are in the group of 15 for construction in 1948; latter is one of the projects to be restudied. Remainder of the projects on these pages are in the group of nine currently under construction contracts. Directly above and below are typical patients' buildings in the 1984-bed neuro-psychiatric hospital at Peekskill, N. Y., designed by the VA's own staff. At top, right, is the 418-bed g. m. project at Providence, R. I.; at bottom, right, is one of 300 beds at Sioux Falls, S. D.;

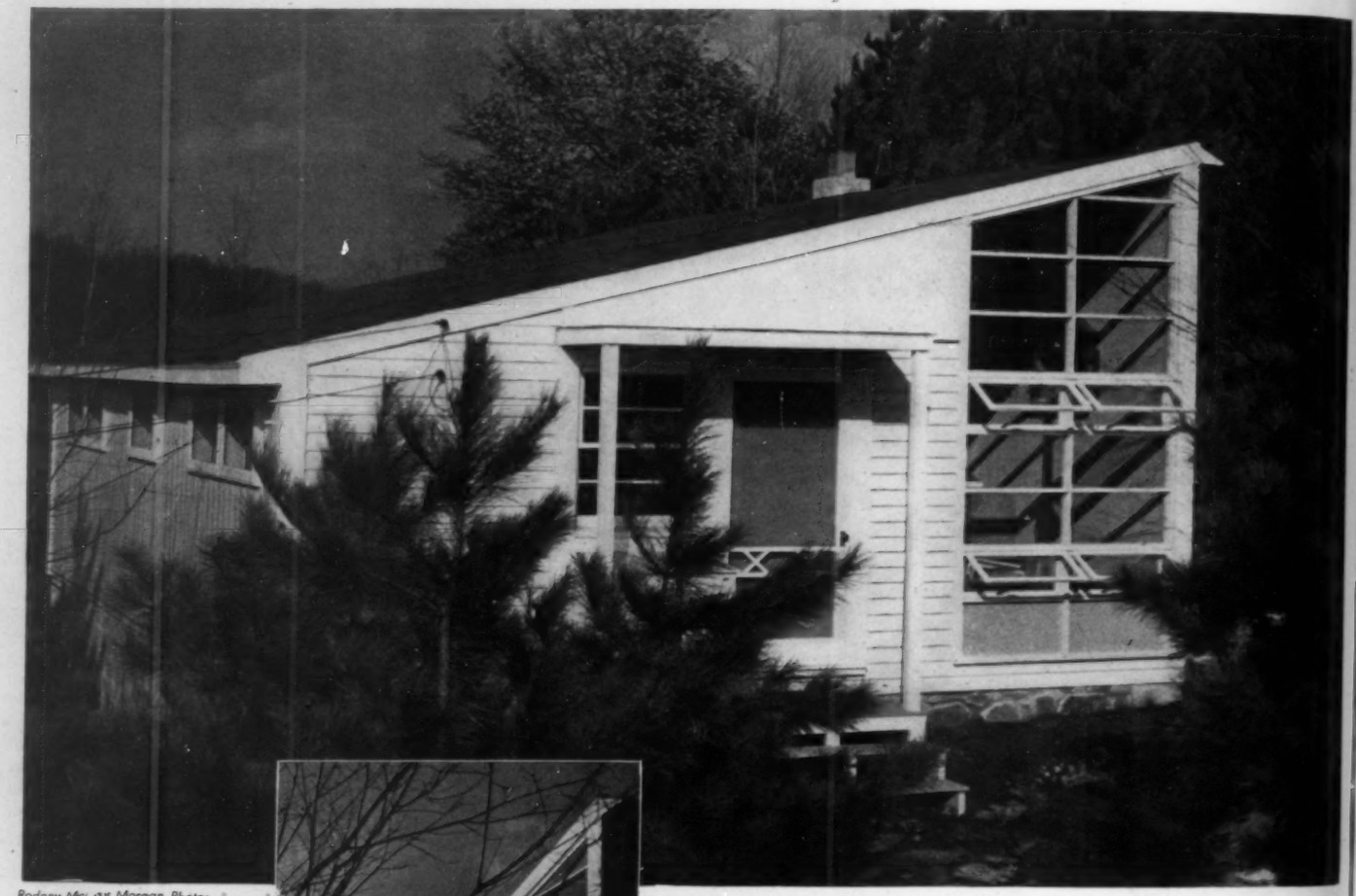


both are by the VA. In middle, right, is 1000-bed g. m. hospital for Buffalo, N. Y.; the project for Albany, N. Y., is almost identical; both are by Eggers & Higgins and Greene & James





TO GET THE MOST FOR THE LEAST—



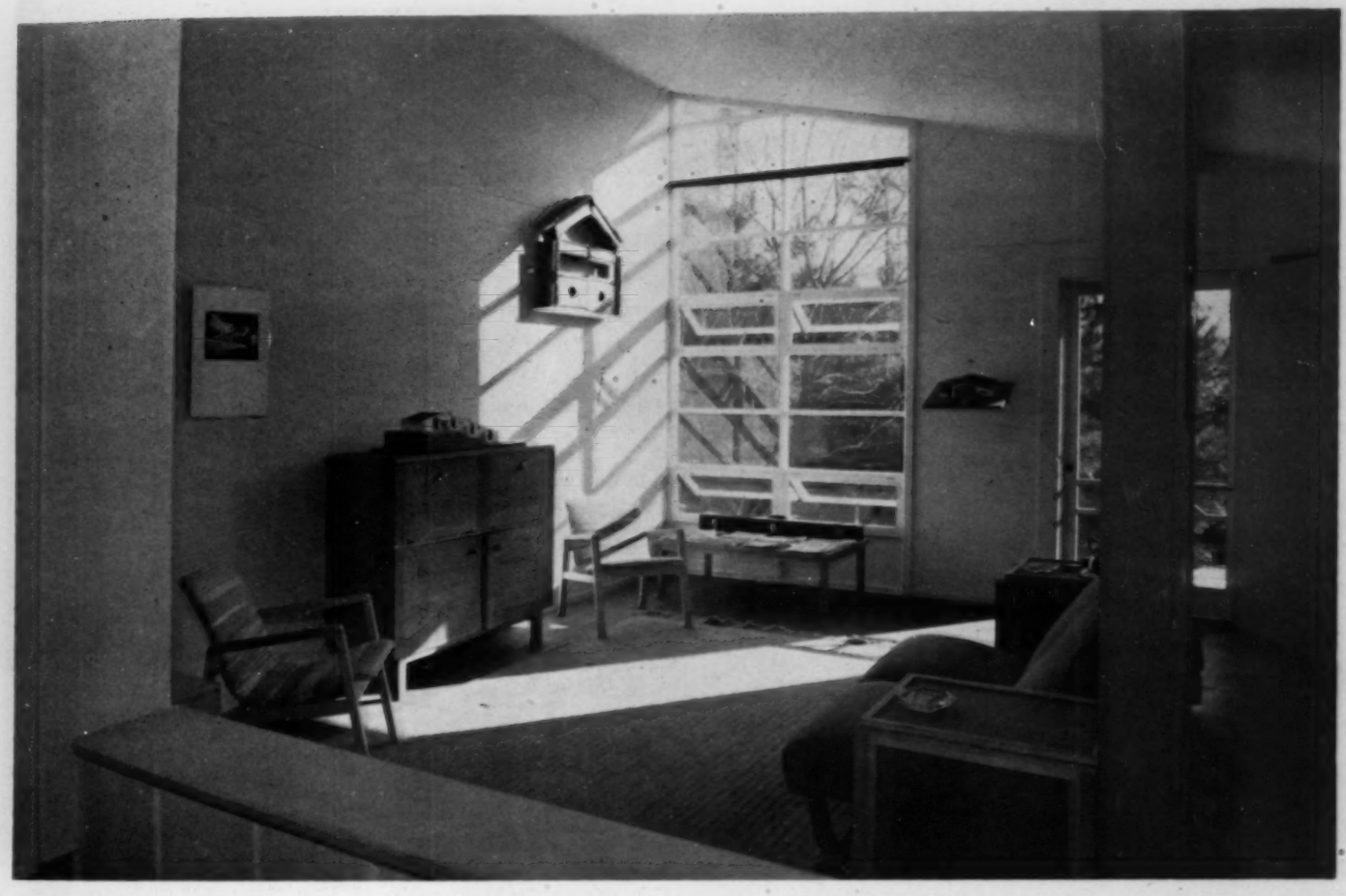
Rodney McCay Morgan Photos

GETTING the most for the least is always desirable, but it demands the utmost in both ingenuity and technical background on the part of the architect, especially in the case of low-cost housing. Most small houses have suffered from cramped rooms and their occupants have suffered from a lack of even a sense of spaciousness. Thanks to thoughtful planning, simple construction and careful detailing there is an illusion of much greater size and consequently much greater comfort and sense of well-being, even though the rooms in this demonstration house actually are small. Except where demanded by requirements for privacy, partitions are eliminated and one space opens into another. The high ceiling and large window help tremendously, too.

Maximum apparent spaciousness, plus efficient room arrangement, and a minimum of required materials,

an experimental house-system developed by Holden, McLaughlin & Associates, Architects, for American Houses, Inc.

Model of a projected two-family unit. Below, the living room looking toward the window and entrance door



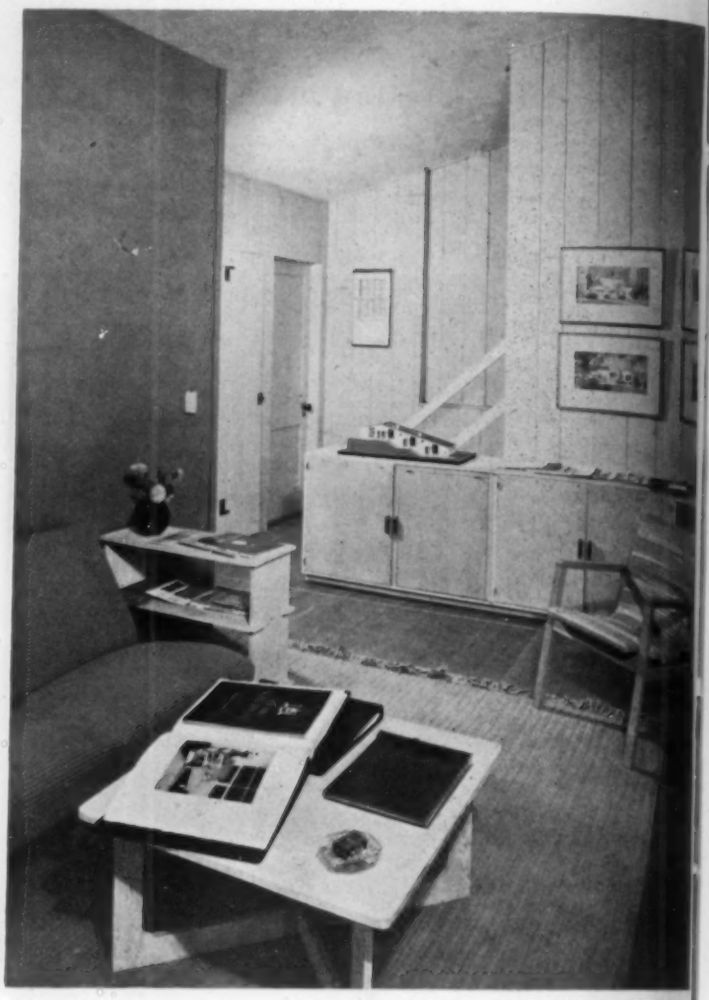
equipment and labor, were major objectives in the design and construction of this house. The plan and section show the effective openness in the arrangement of space, the concentrated fenestration, and the high-ceiling living room, all of which contribute to apparent size.

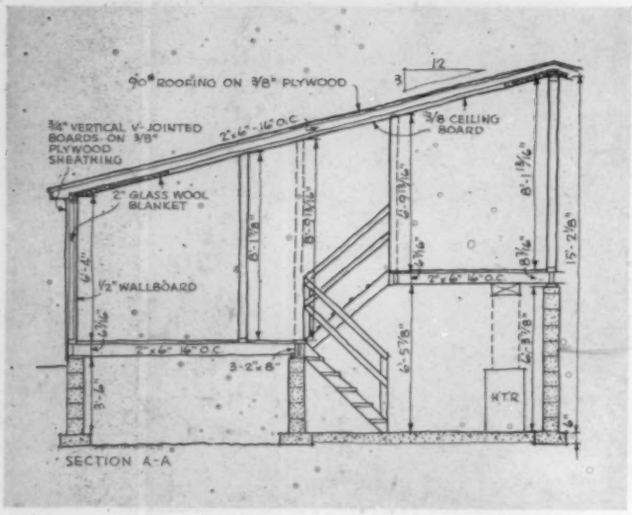
A minimum of material is used structurally as well as a minimum of mill work. Select 2 by 4's are used for finish at windows and doors. Framing of joists, studs and rafters was carefully studied to use smallest possible standard members, eliminating headers in the roof and reducing possible shrinkage. Nothing larger than 2 by 6-in. lumber is used for the structure and consequently no bridging is necessary for joists or rafters. Closets are constructed of single thickness wood without studs and the closet shelving is used as structural stiffeners. The closets serve as sound buffers between the living and bedroom parts of the house. A single exterior entrance eliminates additional exterior walks. All parts are simplified to their utmost consistent with safety. Stair treads are let into structural stringers, with no risers and but a simple plywood soffit. Wherever possible structure and finish are integral.

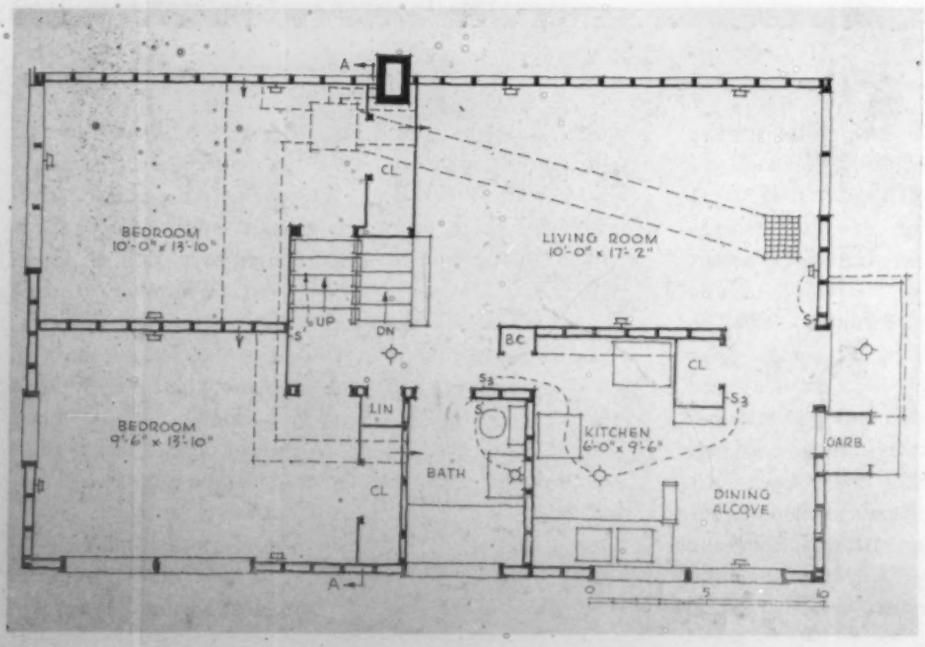
In northern climates footings are at least 3 ft. 6 in. below grade and advantage is taken of this to provide a partial cellar (as shown in the section), with its many advantages but without the expense of excavating to an additional depth of 4 or 5 ft. The slope of the roof permits the useful semi-basement with a bedroom above. Gravity warm air heating is therefore possible and desirable since it produces a warm floor and eliminates mechanical equipment. Simplicity is the keynote of

mechanical equipment as well as design and structure. Costs, both first cost and operating maintenance and repair costs, are thus brought to a minimum. Plumbing can be prefabricated as it is concentrated in the kitchen and bathroom which adjoin to use the same stacks and economize on piping.

While not designed primarily for full prefabrication, the house could easily be adapted to such a construction method. Site prefabrication and quantity production of all members would produce economy.



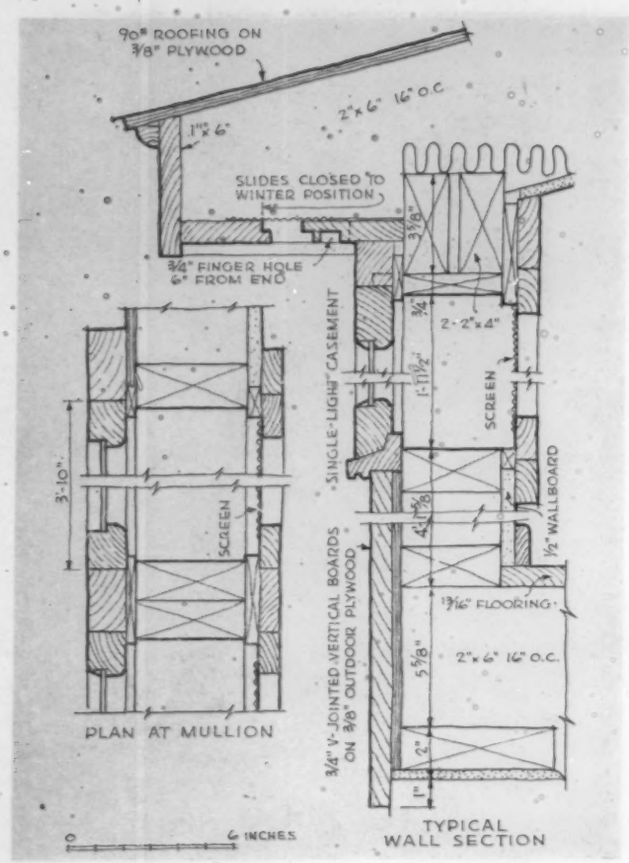




Above left, section showing split floor level to provide heater, utility and storage room under one bedroom; all other rooms on one level. Above, the living room of the demonstration house looking toward the open hall and stair which add to apparent spaciousness of the room. Note storage cabinets. Left, the plan showing simplicity of construction, openness of space and maximum use of even small areas. Heating ducts are shown by the dotted lines

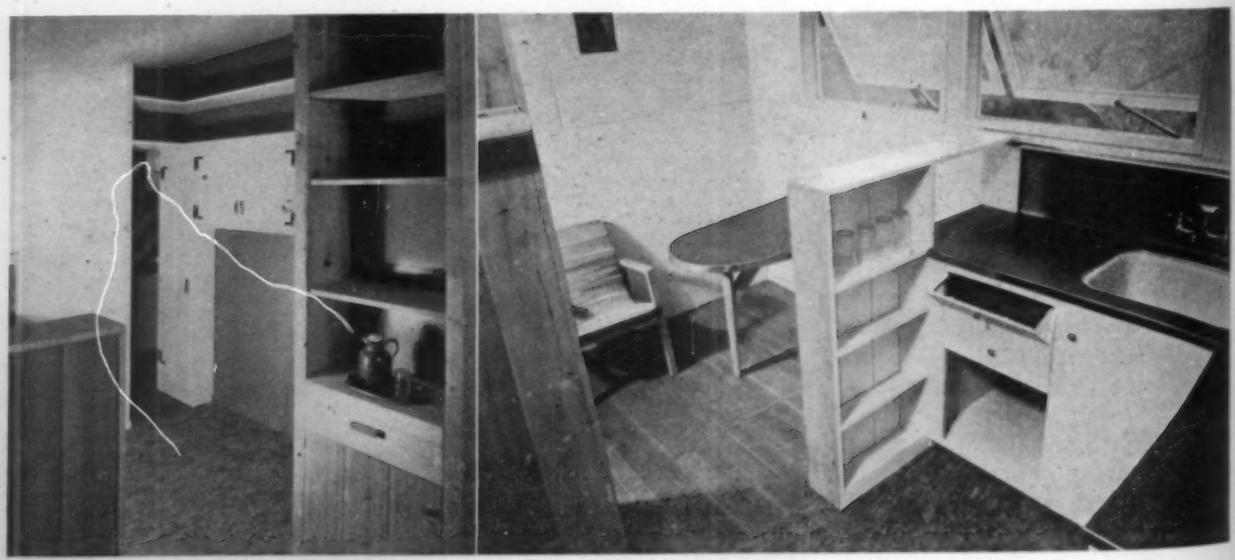
Above, close-up of the living room looking toward open wall of the bedroom, showing simplicity of the stair and the heating grill incorporated in a cabinet. The low cabinets serve to divide the areas without obstructing the visual spaciousness. Insert (from a model) indicates possible fireplace instead of heater-grill. Furniture scaled to the rooms increases useful space. The modern drop leaf table folds to cabinet size; *see photo next page*

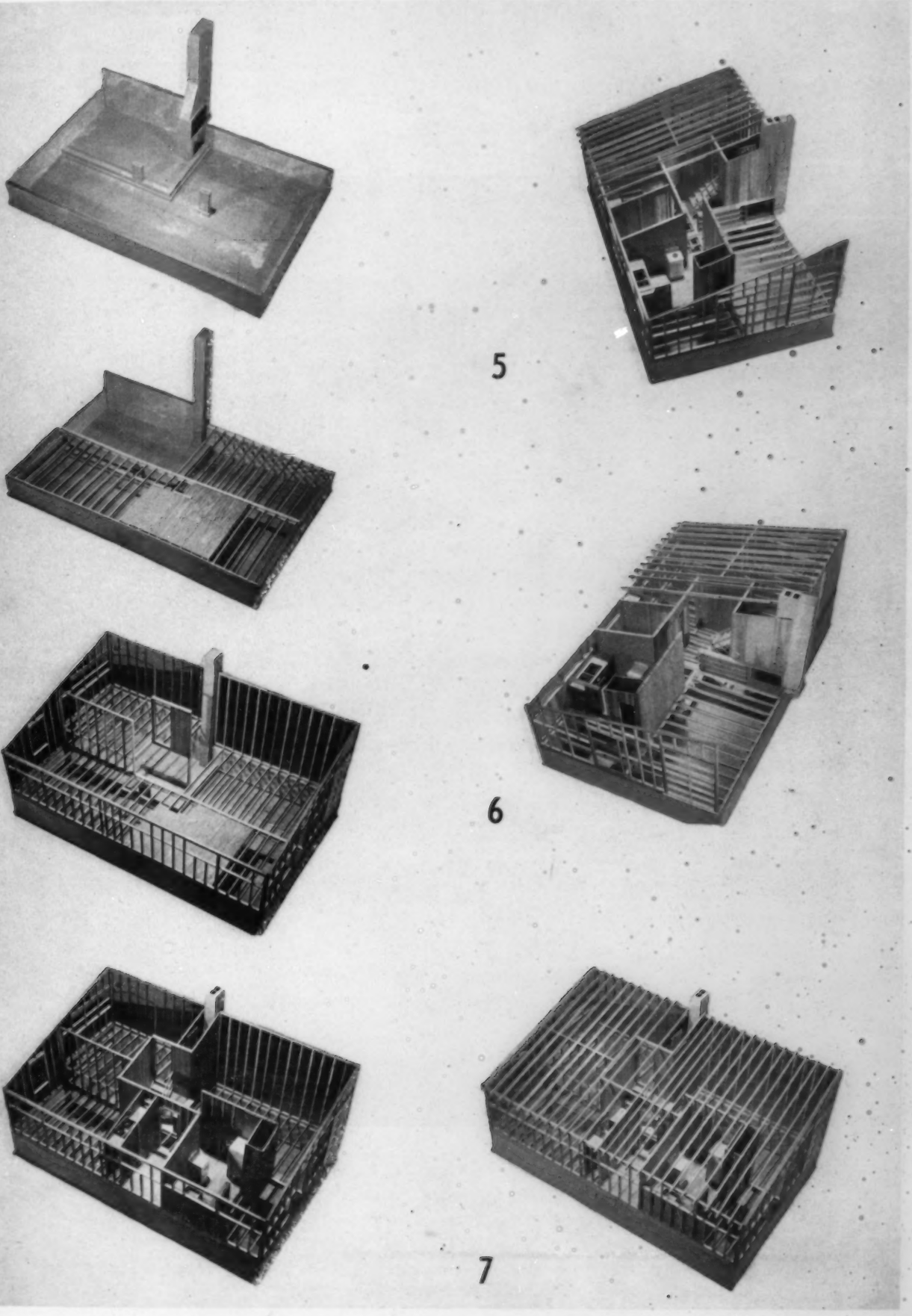
The design and the structural system were carefully worked out and studied in the 3-in. scale model shown opposite. **1.** Foundation and chimney (with fireplace). **2.** First floor framing (no fireplace). **3.** Bedroom floor and partition framing; exterior wall frames in place. **4.** Partition walls in place; equipment installed. **5** and **6.** Roof framing partially in place. **7.** Completed roof framing (note variations in spacing)



Above, section showing simplicity of construction, elimination of superfluous millwork and ingenious slide ventilator for roof

Below, views of the kitchen where every inch serves some purpose and surprising shelf capacity is provided with a minimum of materials. Dining area is adjacent




1
2
3
4
5
6
7

Keith's Home Store, Kansas City:

Antonin Raymond — L. L. Rado, Architects

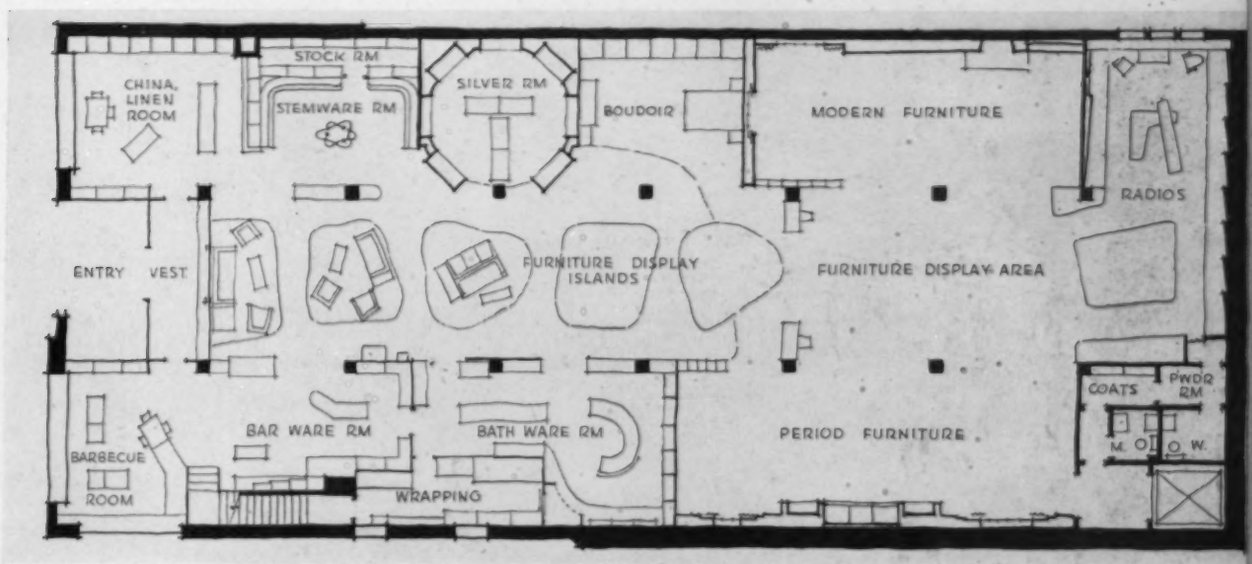
Hedrich-Blessing Photos

WHERE SIMPLICITY IS THE KEY FOR VARIETY

SOMETHING about Kansas City — maybe clean winds blowing in from good earth and grass roots — is reflected in a store design that contrasts, spectacularly in its essential simplicity, with the merchandising flamboyancies coming to be known as "Broadway Architecture." There is in this case a refreshing absence of tortured kidney and related shapes.

Robert Keith, Inc. is a home furnishings store located in the University District, in a shopping area called "The Plaza." Close watch by the local merchants' association prevented much reworking of an existing general exterior "somewhat Spanish" in style. The architects had moreover to fit the new store into an interior laden with columns, beams and piping. An unusual variety of merchandise was another problem.

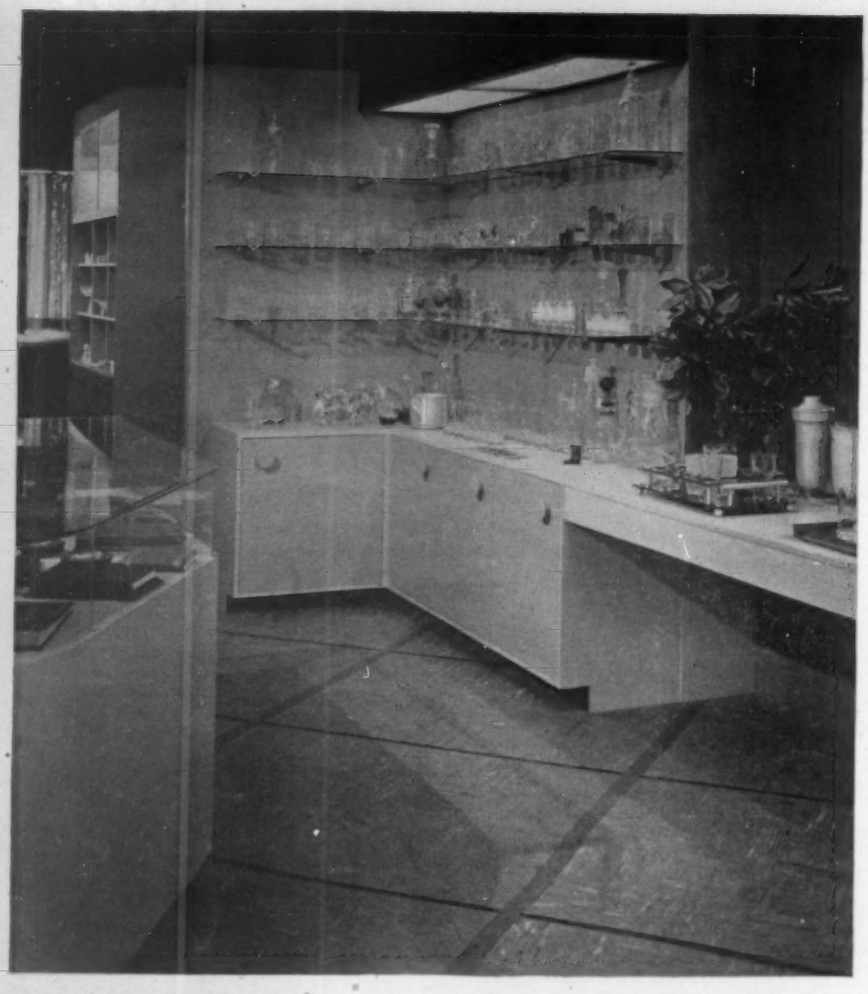
The solution was based on the principle of letting the merchandise sing clearly for itself, with fixtures and display devices designed by the architects to be harmonious accompaniment for the wares contained. At first impression the result is a full chorus in which, with closer attention, individual voices come to express their distinct appeals. Entrance and vestibule enclosed in glass, with two large flanking show windows, allow a projection of allure that reaches to the opposite sidewalk. Impressions are heightened with passage across the entry, and the vestibule gives a moment of pause in preparation for more concentrated stimulus beyond.



Color and lighting in each special section were similarly calculated to point up the inherent attractiveness of the articles for sale, without being in themselves obtrusive overtones. Angle of the photo on opposite page shows the scheme of general lighting. The ordinary customer, with attention fixed on display settings, is seldom conscious of the fixtures overhead, or of pipes and beams against a ceiling painted dark blue.

Photo on opposite page shows store entry with vestibule beyond. Floors are paved with natural tile, bridging the contrast between the "Spanish" building exterior, a fixed quantity, and the store's own simple, open front. Glass framing, shelves and vestibule paneling are natural oak

Photo below on this page shows natural tile of the vestibule yielding beyond the doorway to squares of rubber tile, in gray and tan with black dividing strips. First departmental stimulus to strike the customer from this approach is that of the china and linen room (photo at top, right). Display fixtures have cupboards and drawers beneath for storage. Colors behind the china are magenta and rose; doors beneath are gray; wall above, gold. Linen storage drawers are brick red with gold trim. Stemware room, visible to the right from vestibule, and shown in detail in large photo on opposite page, has slate-blue background to accentuate merchandise, with lighting on the glass items from below as well as above. Tables and chairs are provided for leisurely and comfortable inspection of the merchandise by the customer



Colors in the bar-ware room, top left, are green, vermilion, black and royal blue, giving the section a character somewhat more masculine than other departments in the store. Beyond, to left in the top photo, is the bath-ware room, shown in detail below. Design of the glass-topped counters permits full view without soiling and disarray of the articles contained. Hanging in the background shower curtains

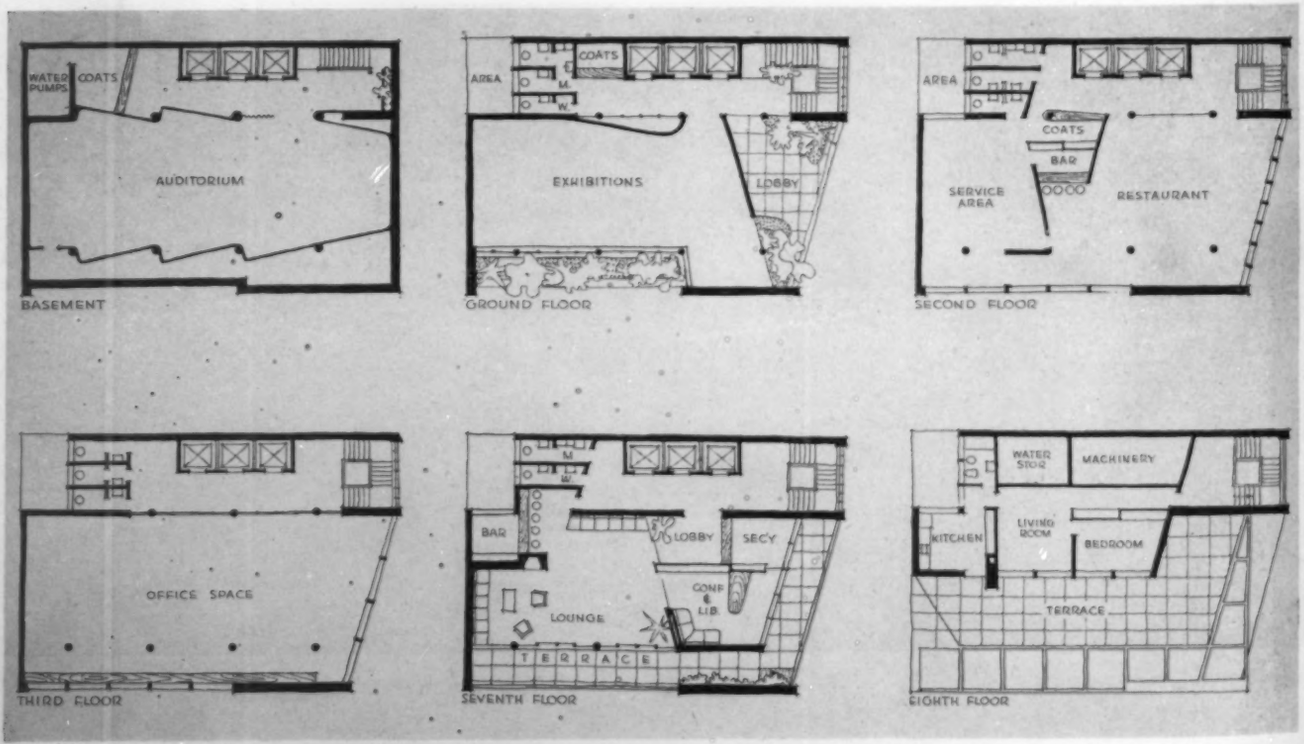
Photo at right shows the silver room. Recessed cases with fluorescent lighting turned on a snow-white background give dazzling definition to shapes and highlights of the articles displayed. Gold-flecked, glass-topped tables are free standing to permit various combinations. Smaller photo at top shows the boudoir shop, in which careful design and placement of fixtures help prevent the look of disorder so frequently besetting these sales areas. Wall is yellow; cases, rose; sliding panels, yellow. Dressing table is cantilevered

BY, OF and FOR ARCHITECTS

A club and office building in São Paulo, Brazil

Forte, Ruchti, Ciampaglia, Architects

MANY an American group of architects will envy the new building Brazilian architects have planned for themselves as a combined club, exhibition hall and office building. The ground or street floor is devoted to exhibition space, handy and inviting to the general public. Below is the meeting room or auditorium which can be used for many different occasions as there is ample storage space for chairs and other paraphernalia when the floor must be kept clear. The restaurant and bar on the second floor is bound to be popular. The floors above should be ideal for architects' offices — rentable space to make the project self-supporting. Construction is of reinforced concrete, brick and glass, resting on pile foundations under the columns.



OFFICE BUILDINGS

ARCHITECTURAL RECORD'S BUILDING TYPES STUDY — NUMBER 130

NEW DEPARTURES IN OFFICE BUILDING DESIGN

By Lathrop Douglass, Architect

THE pitfalls of façade-first design have long been apparent to architects, but I think office buildings particularly require that we forego the sketch-drawing until a thorough study has been given to what goes on inside the building.

It is perfectly true, of course, that between the Twenties and the Forties we should expect progress in matters of exterior design, but I insist that there is equal room for improvement in matters of function. These advances we must assimilate or develop before we can find anything but superficial words in such phrases as "horizontal or vertical treatment," "revealing the skeleton," "all-glass walls," etc.

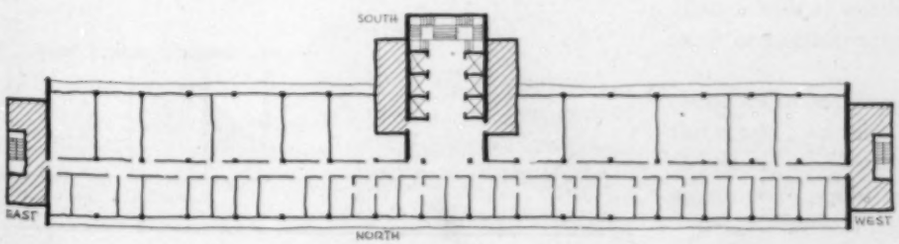
As for the great American skyscraper, perhaps there is a temptation to think that it reached a high state of functional efficiency in the late Twenties. At least some of the few that have been built since then seem to repeat the pattern. I cannot agree that the old ones were so good. Some of them — Rockefeller Center, for example — provided good office space, with a notable quantity of that all-important ingredient, flexibility. But many of them were just façade-first designs. They did not provide that *sine qua non* of an office building: comfortable, efficient, flexible, standardized, economically operable office space. Certainly we can do better today, as this article will attempt to show.

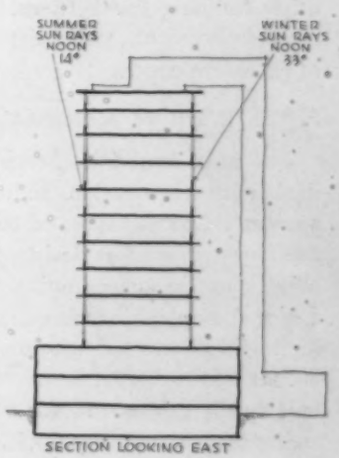
FLEXIBILITY

Flexibility is the most important criterion of all. Corporations grow large, or small, or they move, or change their lines of business. The president of a large concern in Louisiana told me the other day that when they at last moved into their carefully-planned new building they thought nothing ever would have to be changed. In six years 50 per cent of the partition work has been changed.

Flexibility for future changes is not achieved without good planning of many different elements. First, the space must be standardized as far as possible for the largest possible number of uses. Modular locations must be developed for all such things as lighting fixtures, air conditioning grilles or radiators, or other service items, so that partitions can be moved overnight without tearing out important pieces of equipment. Fenestration must be designed in such a way that office widths can be varied to suit changing needs, to provide minimal

Office building plan, by the author, for a latitude of 10 degrees north, with good year-round air temperatures but intense radiant heat from the sun. Long axis is east-west. Continuous horizontal sunshades anticipate sun's angles in winter and summer. Sun never strikes any window, summer or winter. Result: no glare, no blinds, no radiant heat, also rain protection. Stairs and utilities protect ends of building from the sun





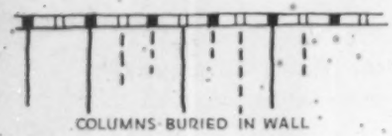
private offices or larger ones without waste of space.

The building managers who struggle with profit and loss figures in the old-time skyscrapers talk a great deal about depth of space from the windows. In an air conditioned, well-lighted building, the problem naturally is not so critical. Any reasonable depth would seem satisfactory, so long as people generally can see somewhere in the distance a patch of sky. Nevertheless, I am inclined to side with the building managers in their contention that excessive depth of space is a waste of money. Where the requirements include a large number of small private offices — for engineers, copy-writers, etc. — the exterior wall space is at a premium, while there may be little use for interior space. It seems poor economy, then, to create undesirable space simply because it can be done cheaply. The number of square feet of usable space per man is the criterion.

I know of two buildings, in different locations, owned by the same company. One has 12 ft. as the standard office width module (and this is far from economical); in this building the space per man is 140 sq. ft. The other building has 9 ft. as the standard width (much more economical), yet the space per man is 200, because of excessive depth.

Expensive exterior; more complex framing; smooth interior wall; excellent flexibility

Inexpensive exterior; columns are unsightly in offices, interfere with best functioning



Inexpensive exterior, but expensive framing; smooth interior wall; good flexibility

Handsome all-glass wall, but partition work complicated; columns restrict desk placing

FENESTRATION MODULES

The most heartfelt speech of the building managers deals with fenestration. Indeed the most serious charge against the skyscrapers of the Twenties is that usually the fenestration was designed for appearance and froze office space in uneconomical units.

For example, a handsome well-appointed office building in the South has windows 6 ft. 6 in. c-c. The result is that offices cannot be narrower than 13 ft. Six-and-a-half feet is too narrow for a private office, even for an engineer's cubicle. But 13 ft. is much too wide.

Rockefeller Center, on the other hand, stands out in my opinion as far ahead of practically all of our modern skyscrapers. Perhaps the simple alternating rhythm of 4½ ft. windows and 4½ ft. piers is not revolutionary enough in "design" for armchair commentators, but there is an almost unrivaled flexibility. Such buildings are functional in the true sense of the word.

The Tishman Building, newly completed in New York, has taken a different approach, but one that also is truly functional. There is a continuous row of windows separated from each other by a 12-in. mullion. Partitions can be placed anywhere on a 4½ ft. module, allowing offices of 9, 13½ and 18 ft. There are no columns projecting into the rooms, and the windows are virtually a continuous band of glass. The partitions, however, have to be on this exact module, whereas in Rockefeller Center the 4½ ft. masonry pier permits an infinite variety of widths.

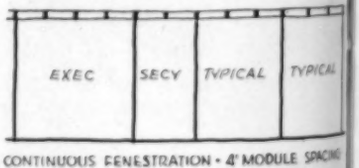
Architectural magazines are showing more and more buildings with all-glass walls. Superficially the all-glass wall seems highly functional. It may be, in many cases. In others it may simply be creating a problem in order to solve it.

Glass walls with their maximum daylight are obviously desirable, provided we solve the problems of radiant heat of the sun and of sun glare. Otherwise our glass wall will be nullified by venetian blinds, or the occupants will be scorched, even if we specify special glass to cut the actinic rays by 50 per cent. And what if the sun keeps playing hide and seek behind the clouds?

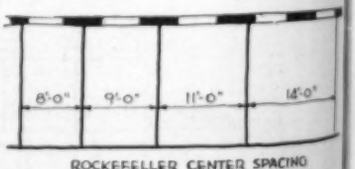
Early installations frequently were not adequately calculated in this respect. For example: I visited a very nicely-planned air conditioned office building on one of the Caribbean Islands. Large areas of the walls were in glass block, with a small clear-glass window every so many feet, through which one could feel contact with the world. The glass block was carefully checked for its heat transmission coefficients and the air conditioning designed accordingly. But nobody had considered the problem of direct radiant heat rays of the sun which went right through the glass. The occupants were almost blistered when the sun came around their way, and a tremendous added load was put on the air conditioning.

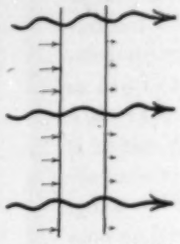
Bad enough to guess wrong with glass block. Think of the problem with ¼-in. plate glass, even double glass

Continuous fenestration on 4-ft. module; offices of 8, 12 or 16 ft., but no fractional variants



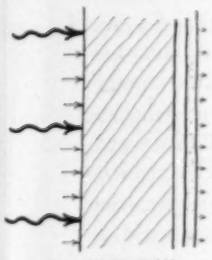
Alternating 4½-ft. windows and piers give exceptional flexibility; office widths can be as desired





GLASS OR GLASS BLOCK WALL

With glass or glass block walls, heat transmission is partly by conduction and convection, partly by radiation through the glass. Unless fins shield glass, air conditioning must meet this load



TYPICAL MASONRY WALL

In the typical masonry wall transmission of heat is by conduction and convection. Radiant rays from the sun tend to heat up wall and increase conduction, but do not of themselves penetrate the building

with air space. The air space doesn't mean a thing to those heat rays.

I should make it clear that I am not criticizing glass or its manufacturers. The heat problem, both ways, is carefully stated; you can look in Sweet's and find tables for both heat transmission and radiant heat for different kinds of glass or glass block. What I am trying to bring out is that the designer cannot blithely assume that the all-glass wall is wonderful without designing his building very carefully.

As an example of the design problem, I am planning a building for a tropical location at a high altitude. We worked out a long narrow building, with plenty of glass: all offices have continuous windows. The long axis is placed east and west, offices facing either north or south. Only utilities are on the sun-baked east and west ends. Fins or sunshades along north and south walls anticipate the varying angle of the sun, to the north in summer, to the south in winter. The sun never gets into any window at any season. With this protection against radiant heat of the sun, we need no air conditioning, for the air temperature is ideal the year around. Nor is there any need for venetian blinds.

COLUMNS AND FRAMING

Exterior columns are a definite problem. They tend to interfere with partitions, upset modular spacing of windows and may have an unpleasant appearance. The system of cantilevered floors with columns set back a few feet from the exterior seems in actuality to be but a *post facto* rationalization of the desire for the all-glass wall. For loft buildings or small offices, where changes will not occur, this system may be all right, but partition locations are a serious matter for a large building requiring many types and sizes of offices. There is reduced flexibility of partition work, and desk spacing is handicapped unless columns are some 6 ft. away from the wall. Should flexibility and interior planning economy be sacrificed just for a "smart" exterior? Perhaps in some cases this should be done for the advertising value of good appearance, but it is not functional architecture.

Columns outside the building proper seem a better solution, not because they "reveal the skeleton" (which they do), but because they give a smooth, uninterrupted interior surface to the exterior building wall, so that partition work can be standardized and simplified. This system has been used on the Savings Fund Building in Philadelphia, and appears slated for a number of projected buildings. It seems like a very practical idea, except for the higher cost of exterior masonry and the more complicated column connections.

A still better solution under certain circumstances seems to be the use of angles or T's at frequent intervals imbedded entirely within the wall. They are less complicated than exterior columns; interiors are smooth; spacing of windows can be absolutely uniform, so that any module system can work. This system is ideal for continuous windows.

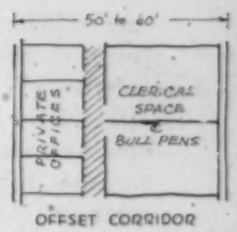
The Tishman Building seems to be pioneering this idea in New York, though building code requirements have resulted in very heavy mullions.

Following along this line, I am currently planning, with Carson & Lundin as associates, a long six-story office building for which the owners have very intelligently insisted on a 4-ft. module, in order to provide

When occupant has nearly all small offices for such employees as engineers or copy writers, interior space would be largely wasted

NARROW WING

When there is a good balance between private and "bull pen" offices, or where windows are desired for all, try the off-set corridor

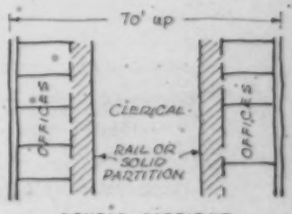


OFFSET CORRIDOR

For a commercial office building with many small tenants, clerical areas are usually inside; depth from window not much over 25 ft.

TYPICAL OFFICES

For large offices inside space may be used for open offices, with partitions only for private offices. Double corridors set off by railings



DOUBLE CORRIDOR

8-ft. secretary offices or engineer cubicles, 12-ft. standard offices for one to two people, and 16-ft. executive offices. This would be impossible without an absolutely uniform spacing of windows on the 4-ft. module; i.e., you must be able to place a partition equally well at any mullion and still have exactly 8, 12 or 16 ft. c-c. partitions. We have been able to cut the exterior steel down to a box of two 6 by 3½-in. angles welded and placed every 8 ft.; i.e., every other mullion is structural.

This scheme may have an added advantage in uniformity. To illustrate: I remember once showing a sketch of a proposed plan to a former official of this same company. An over-zealous draftsman had very accurately scaled off the areas of the various offices on the sketch. The office assigned to the man in question showed 296 sq. ft., whereas his equal-ranking neighbor had an office marked 300 sq. ft. In all seriousness he called me up and asked why he had been discriminated against in the matter of the size of his office.

Cost of maintenance (operating cost) seems too frequently ignored. It is inescapable that every maintenance dollar spent in a year is the equivalent of $15 to $20 in first cost (depending, of course, on interest rates). If a company is planning an office building which is expected to last a score or more of years, it scarcely seems intelligent, unless there is difficulty in financing, to save $100,000 on first cost by cheap material or poor planning, and then have for the life of the building a maintenance bill every year whose capitalized value might be $200,000. The upward spiral of inflation underlines this argument even more forcefully. Annual charges on the capital investment do not increase as inflation proceeds, but maintenance costs go steadily upward; in fact have doubled in the last few years. The prudent man who insisted on cutting maintenance and operation costs to the minimum should be reaping his reward.

PERHAPS THE BEST IS ACTUALLY THE CHEAPEST

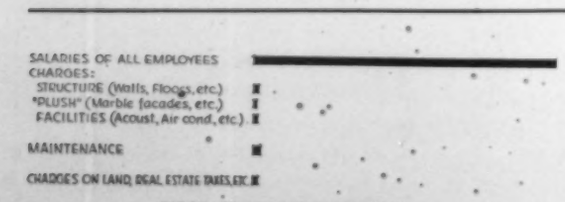
By Lathrop Douglass, Architect

If this really is a new era for office buildings, with improved functional designs and better styling, let it also be a new era as regards costs. And not a penurious era.

In making this special plea for a new type of realism on costs, I am not going to dwell upon the high building costs that have been making headlines. Certainly costs are high, but the *level of costs* does not greatly affect the *comparative costs*. This message deals with relative costs of the buildings and the operations that go on inside them. I think I can show that in the past we have been building offices too cheaply.

It seems reasonable to say that "first costs" fall into three fairly obvious classifications:

1. The cost of space; that is, the structure itself.
2. The cost of "plush," or the advertising value of a handsome show — the marble, the 100-story tower.
3. The cost of such features as partitions, lighting, air conditioning, acoustical treatment, etc., which are all a means of improving the efficiency of the office employees.



FIRST COSTS VS. SALARIES

To repeat once again, an office building is a means of providing, on a proper site, the most comfortable, efficient, flexible space for housing the activities of employees; whether for one firm or for many. The important and very interesting question is: to what extent do these features affect the employee? Does a man turn out more work in a cool, dehumidified building, a well-lighted building with a private, sound-proofed office for himself? How much more work does he turn out in these surroundings than in a humid, hot, ill-lighted bull pen amidst the clatter of typewriters and the time-wasting gabble of his fellow employees?

During the early part of the war I worked in a room with two other people, no acoustical material, hard floors and ceiling, poor lighting, drafty, no air treatment. When I wasn't wasting time talking to my office mates I was going crazy listening to the racket of their talking to each other. When people came in to see me I was apologetic. In the summer the office had to be closed every so often because the heat made work an impossibility. Yet this was structurally and in appearance one of the best office buildings in New York. I used to try to calculate the average amount of time I lost every day over a long period of time. From all causes combined, the best guess I could make, and of course it was only a guess, was about 20 per cent. I understand actual controlled experiments have been made on this subject. Anyway at that time I had a salary of around $8000 a year. Twenty per cent of $8000 is $1600 — a possible $1600 worth of lost time every year. The capitalized value of $1600 should be around $25,000. On the other

hand, how much would it have cost to give me a first-class, private, air conditioned office all to myself, with a good acoustical ceiling and good office furniture — i.e., space and equipment that would for the most part eliminate that estimated 20 per cent loss in efficiency?

Curious as to the answer, I worked out not long ago the following series of tables. Different interest rates, salary averages and other cost units can be substituted for those I have used, but the results will be much the same. To me they are amazing. Why should millions of perfectly good dollars be literally thrown away through inefficient working conditions, year after year, by the false notion that bare minimum standards save money? Actually the most perfect, efficient, attractive working conditions are literally cheap compared with the loss in efficiency from the unsatisfactory conditions.*

An engineer, or a bookkeeper, earning (with all benefits), say $6000 a year occupies a portion of a badly-planned bull pen, hot and humid in summer, incorrectly lighted, reverberating with the noise of conversation and typewriters. He occupies a certain area of rentable space. He has a certain average daily output of work which is directly affected by the heat, the noise, the idle conversation, the general office morale.

Should his firm consider either an entirely new building, or modernization and expansion of existing space, in order to secure greater output per man, what percentage of this average employee's annual salary will these improved conditions cost? If it costs 1 per cent or 2 per cent, and his efficiency is improved by 10 per cent or 20 per cent or perhaps 50 per cent, why, the profit is 1000 per cent or maybe much more. The annual payroll in any average office is so very much greater than the annual charges for modern improvements that it seems almost an axiom that improving the employees' efficiency is what counts — the cost of space and improvements is negligible.

To make a common ground for comparisons, we can assume certain figures, which of course could be easily adjusted to fit any given set of conditions:

Assume 150 sq. ft. of net rentable space per employee (this figure is intentionally liberal and would include a share in the corridors, etc.). Assume $6000 average salary (any other figure would serve just as well). Interest and amortization @ 6 per cent.

1. *Acoustic tile* to reduce the distraction from noise:

Cost per employee @ 50¢ per sq. ft.	$75.00
Annual charges per employee @ 6 per cent.	4.50
Percentage of salary	.075

This is the equivalent in cost of only *19 seconds* of the hypothetical employee's working day. And there is no added maintenance cost.

2. *Office partitions* to provide privacy and space to concentrate, reduce idle conversation and build morale:

Good quality movable metal; assume $20 per lineal ft. allowing 25 ft. per man

Total cost per employee	$500.00
Annual charges @ 6 per cent	30.00
Percentage of salary	.5

This is the equivalent of only *2 minutes* of daily time (assuming of course no increase in allotted floor space). And here again there is normally little maintenance to be considered.

As a matter of interest in this connection, charges for masonry partitions would be only about $12 annually, but there is scarcely a firm that does not continuously change its office layout, and in comparing the cost of movable versus masonry partitions one should take into account the fact that movable partitions can be changed at will even overnight, whereas a plastered and painted masonry partition, if changed, will cost a lot more than the contract cost because of the large amount of employees' time lost from dust and noise and confusion, while existing walls are torn down and new ones built up, plastered and painted.

3. *Air conditioning*

Total cost per employee @ $3.00	$450.00
Annual charges per employee @ 6 per cent.	27.00
Annual operating costs (a guess)	40.00
TOTAL ANNUAL COSTS	67.00
Per cent of employees' salary	1.17

This is equivalent of only *4½ minutes* of the hypothetical employee's day. Think of this in terms of afternoons off because of 90° up temperatures, of lackadaisical work, of sleepiness from stuffy rooms in winter, to say nothing of the continuous dirt and the cost of janitors.

Until I worked out these figures I had been recommending omission of air conditioning in the New York area as an unnecessary expense. These figures have changed my mind.

The above are of course only a few of the more obvious items that could vastly improve employee efficiency and save payroll expenditures. A similar tabulation could easily be made for furnishing or other little extras which might improve working conditions.

As a final example let us assume an entirely new building, modern, complete with every common-sense item of good planning and worthwhile detail and equipment practicable.

If it cost in the neighborhood, let us say as a broad guess, of $16 per sq. ft., the total cost per employee would be $2400. Inclusion of $600 more for land value would bring this to $3000. Charges on this investment @ 6 per cent would be but $180. Adding in taxes @ $90 and operating expenses @ $150, the entire operation would come to an annual cost of $420.

However, for the poorest kind of crowded unsatisfactory space one would be paying in today's rental market, let us say $300 per year per man.

So your new well-planned modern building with its enormous payoff in increased efficiency and morale would actually cost only the difference between $420 and the $300 rental for existing space. That is, all the improvements of the new building would actually cost but $120 more per year per employee.

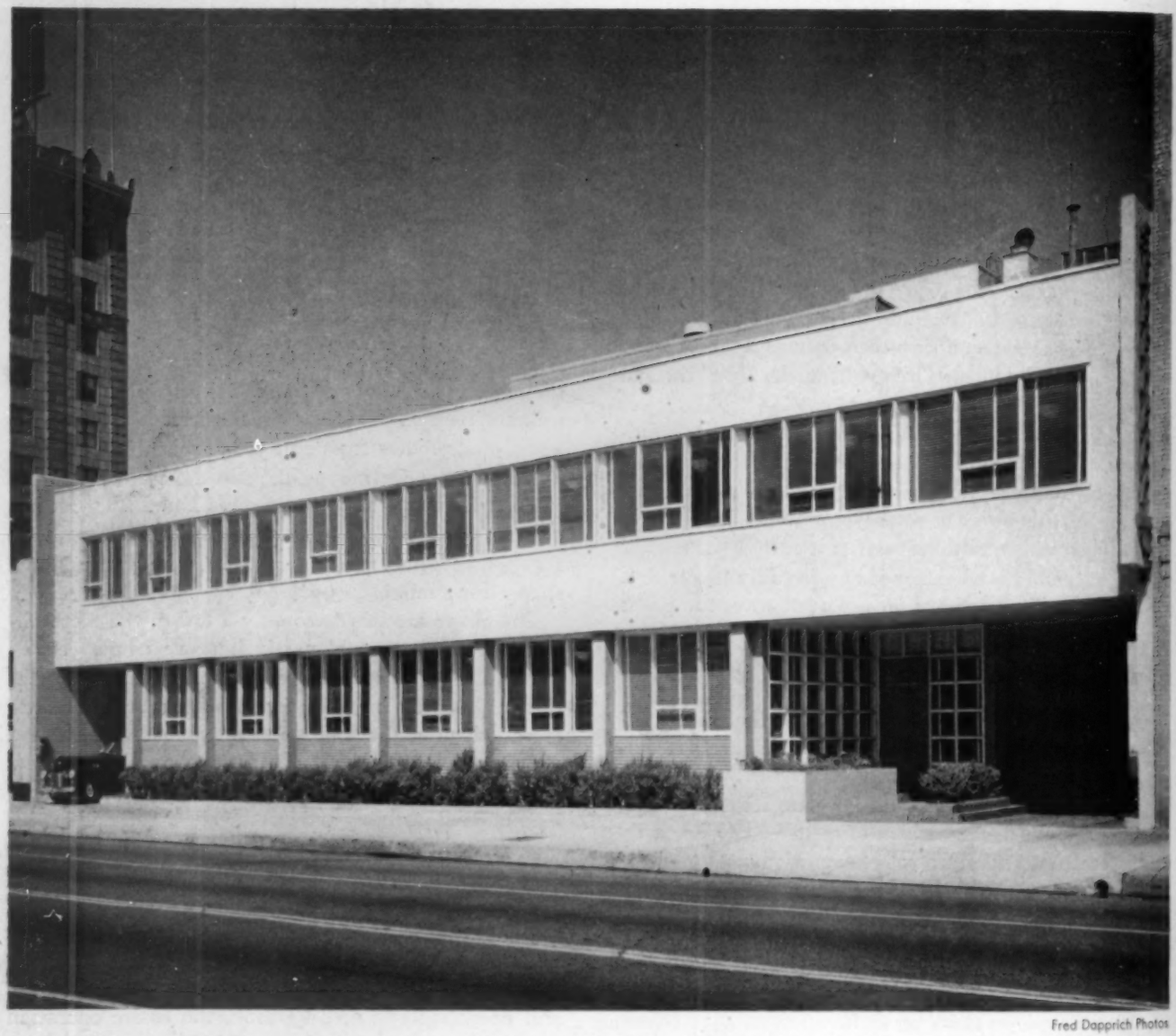
This is 2 per cent of our hypothetical employee's salary the equivalent of less than *9 minutes* of his day.

Is this argument sound? If it is, why then, what are we waiting for?

* *This thesis has been forcibly presented by C. F. Braun in his pamphlet, "White Collars and Tools."*

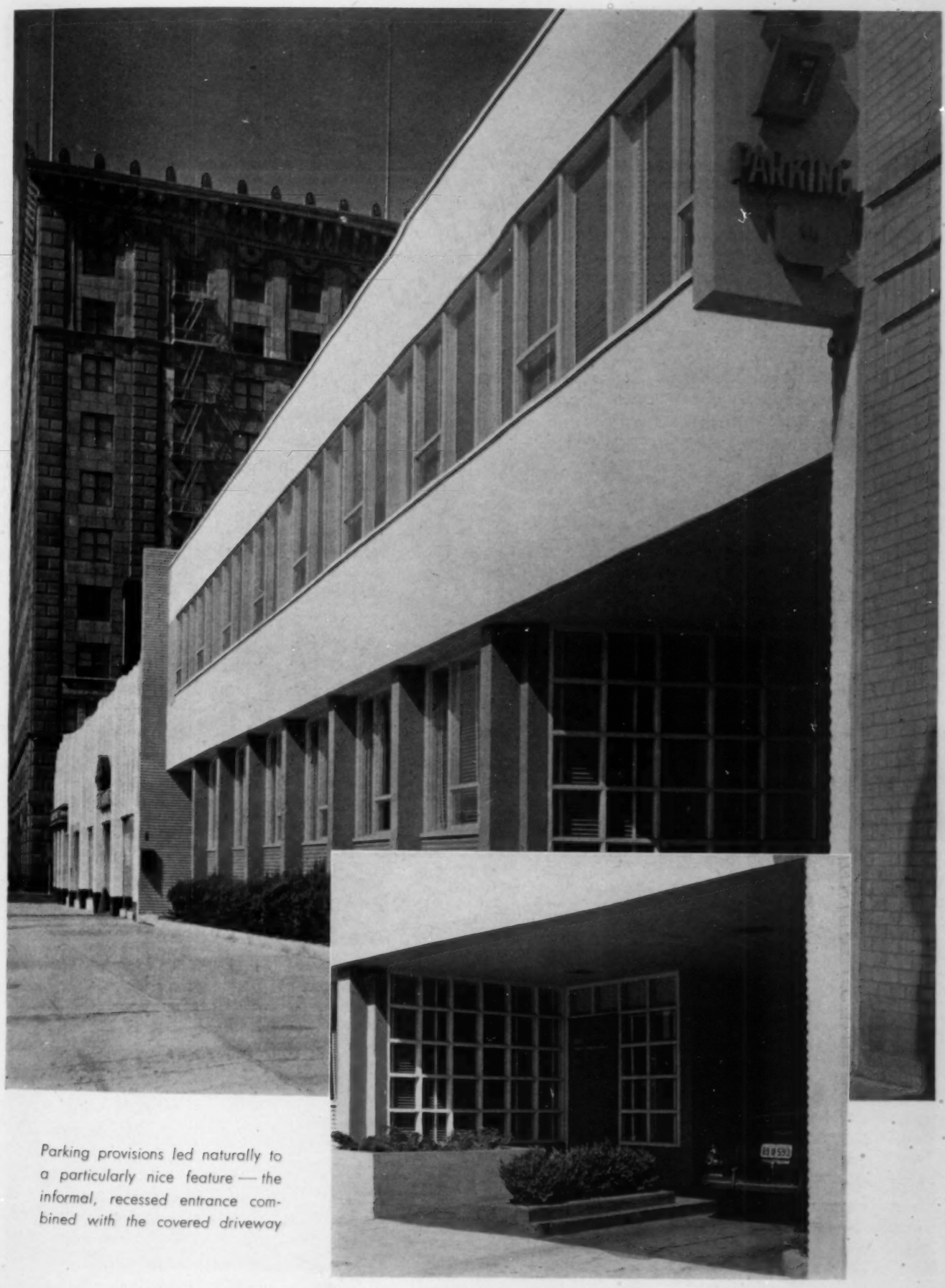
Eugene Weston, Jr., Architect

HAS THE AUTOMOBILE MADE THE SKYSCRAPER OBSOLETE?

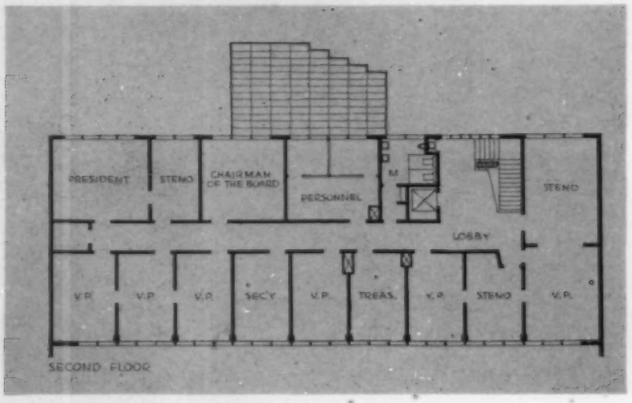


Fred Dapprich Photos

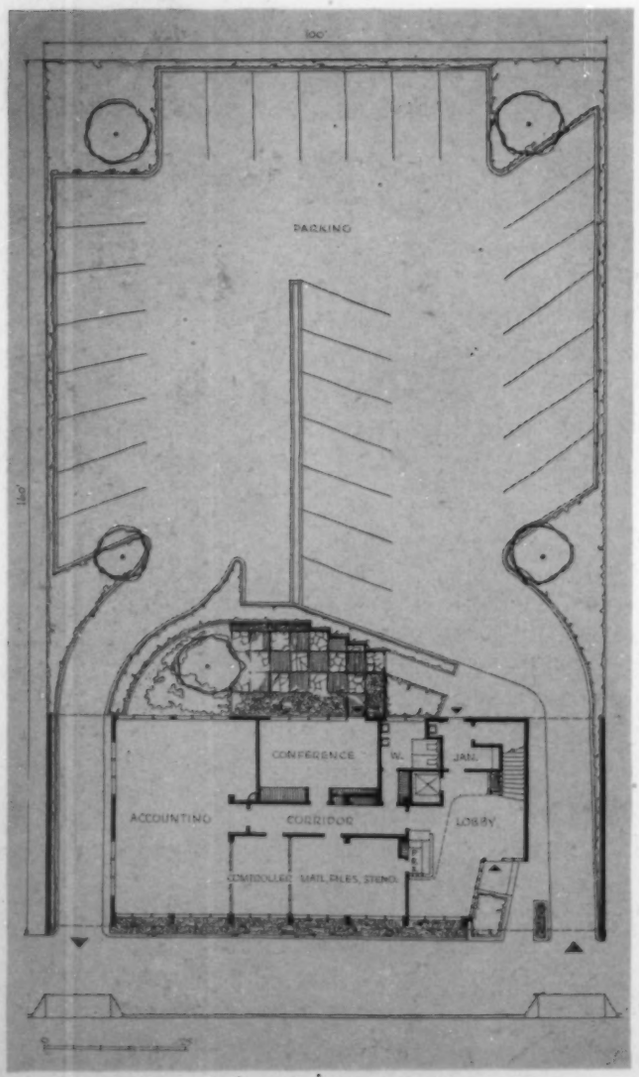
SOME interesting questions on planning insistently hover about this nice little "drive-in" office building. Here is a fairly large site in downtown Los Angeles developed with a two-story building, with its private parking area occupying most of the plot (plan on page 126). For example, has the parking problem become so compelling that it has overridden the old rules of economical site development? Is the skyscraper to fall victim of the automobile? Or have past financial difficulties of large office buildings made them unpopular? Or maybe the so-called "amenity values" of parking space and garden proved so attractive that a large building for this site never was seriously considered. The architect contents himself with the simple statement that "in view of the already crowded adjacent automobile parking facilities, it was decided to provide ample parking space at the new location." The building is completely air-conditoined, the equipment being housed in an insulated machine room on the roof. The small vents in the windows were not required for the functioning of the system, but were included as a psychological hedge against a completely closed building. The building has a concrete frame, floor system and exterior walls, with a wood roof system and wood windows and frames.



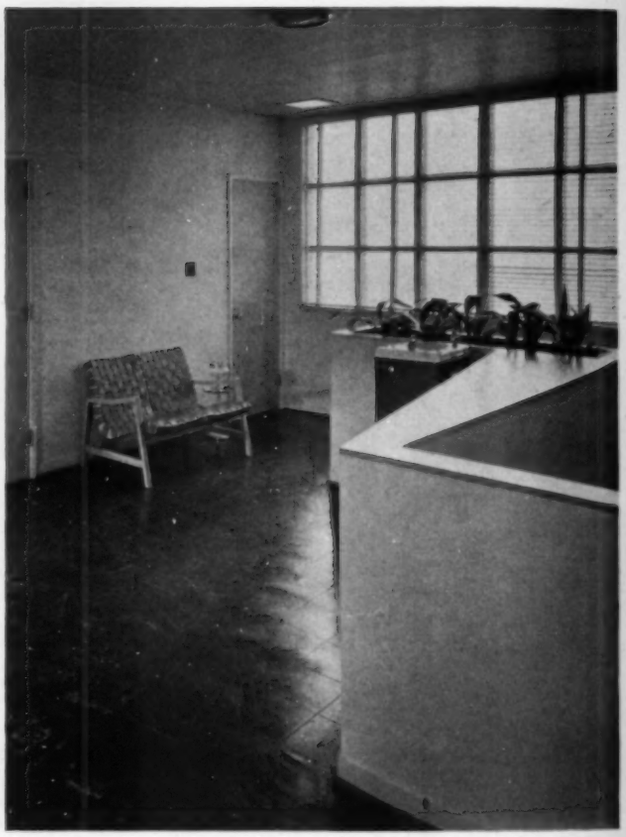
Parking provisions led naturally to a particularly nice feature — the informal, recessed entrance combined with the covered driveway



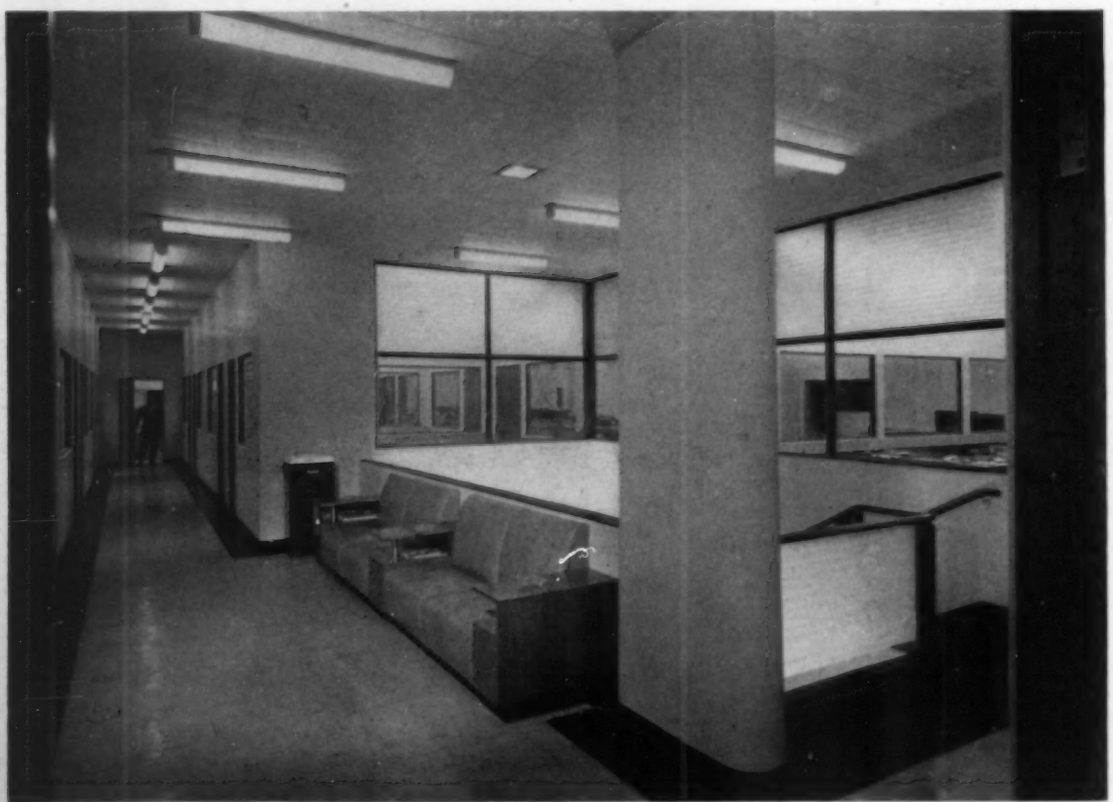
First floor, shortened by the two driveways, houses only general offices, lobby and conference room. This last, opening into the garden, has a small kitchenette, as this company makes a point of daily conferences, at which a cup of coffee brightens the morning



Public lobbies and corridors have grayed ochre walls, and all offices have grayed yellow-green walls. Conference room (opposite page, below) has blue-green walls, wine colored upholstered furniture and a white ceiling. Woodwork is painted to match the walls



Street frontage is planted with boxwood myrtle and Pfitzer juniper. In the parking area the ground cover between bumper curbs and property lines is English ivy, and Maderian ivy is planted against the building walls, with Canary Island ivy at the north property line. Other areas have ironbark Eucalyptus, ricepaper plants and wax-leaved Privet, Ospedistra and Philodendron in boxes



Architectural treatment was calculated to express a knowing and capable efficiency, with landscaping showing equal restraint. Buff face brick was used for the exterior, with fluted limestone pilasters. Windows are double glazed, with venetian blinds between inner and outer glass to deflect the heat of the sun from the interior

FOR ITS OWN OFFICES THE CLIENT SPECIFIED QUALITY

TREND implications are strong also in this office building added onto a manufacturing plant. Whatever the reasons for locating the offices with the plant, one is tempted, on reviewing this building, to read into it a consideration of some import. Where, in the old downtown office buildings, could the company find the quality of office space they built into this building? Here is complete air conditioning, good sunlight control with special window design, "Q" floors for service facilities, a complete acoustical installation, 50 foot-candles of lighting, not to mention the substantial if intangible values of good modern design. At any rate, here certainly is support for the contention of Lathrop Douglass (page 119) that the economics of office building *use* favor the inclusion of a great many seemingly expensive items which increase the efficiency of the office staff that works in the space. The designers comment that "by a peculiar chain of circumstances, this building was built at a low period in the cost cycle," but it is doubtful if the relation between first costs and office salaries would change much at any other point in the cycle, and obviously the company was basing its choices on this factor. The building was built for the Illinois Tool Works Company, at 2501 North Keeler Avenue, Chicago, by The Austin Company, engineers and builders.

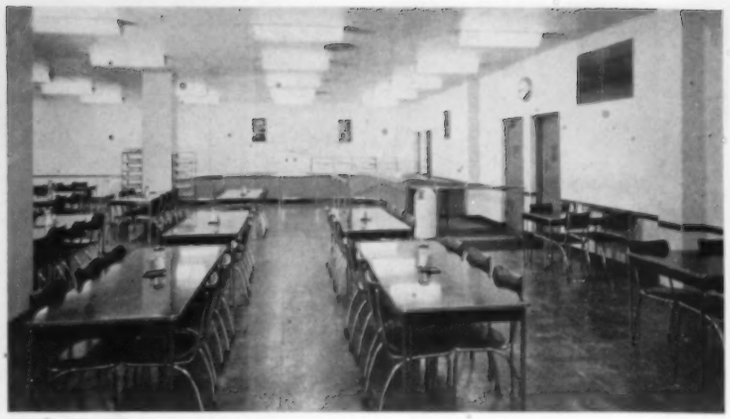
Walls of the first floor lobby, left, are in natural walnut veneered hardboard. Walnut and red leather upholstered furniture throughout the building was especially designed by The Austin Co.

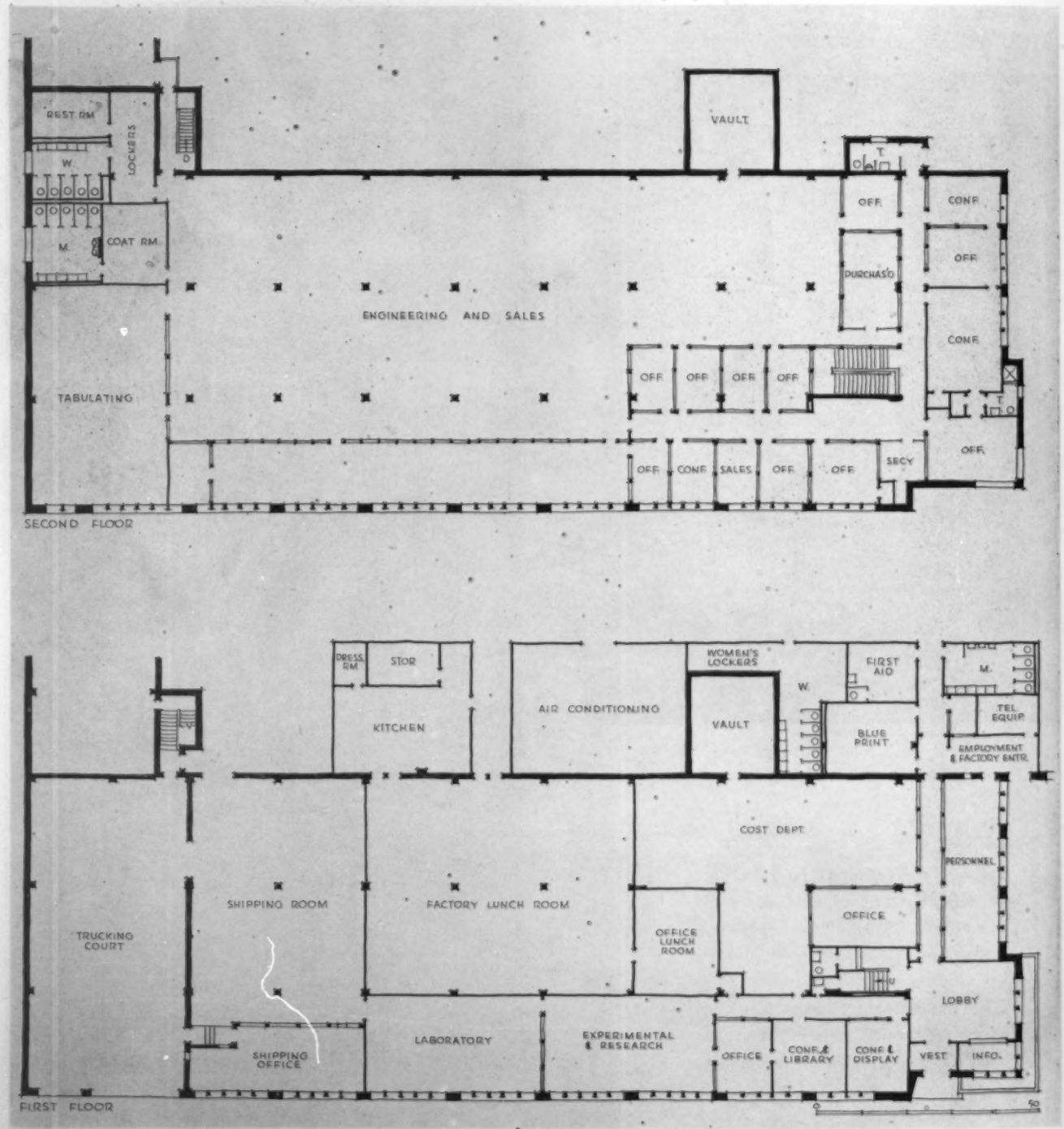
The general office areas, above left and center, have a minimum of fixed partitions, to insure flexibility in use. Display cases in reception room, left, were designed for showing company advertisements, but are deep enough so that small tools or other company products may also be displayed

Directors' room, right, is paneled with walnut veneers, and furnished with red leather and walnut chairs and tables. Asphalt tile floor and metal acoustic ceiling are standard for the building

General office areas have acoustic metal pan ceilings, with recessed fluorescent lighting fixtures. Light-colored asphalt tile flooring helps in the distribution of light. Accounting operations are concentrated behind 6-ft. partition, still noisier business machines are enclosed with full-height partitions

With complete air conditioning, high-intensity lighting, acoustical control, and so on, there is much more freedom of floor plan than would be possible in a rental building. Open office areas can be very deep, and interior private offices might be feasible (these have full-height partitions with clear glass). Interior space on the first floor here proved very useful, for factory dining facilities (right), and certain departments can overflow into factory space

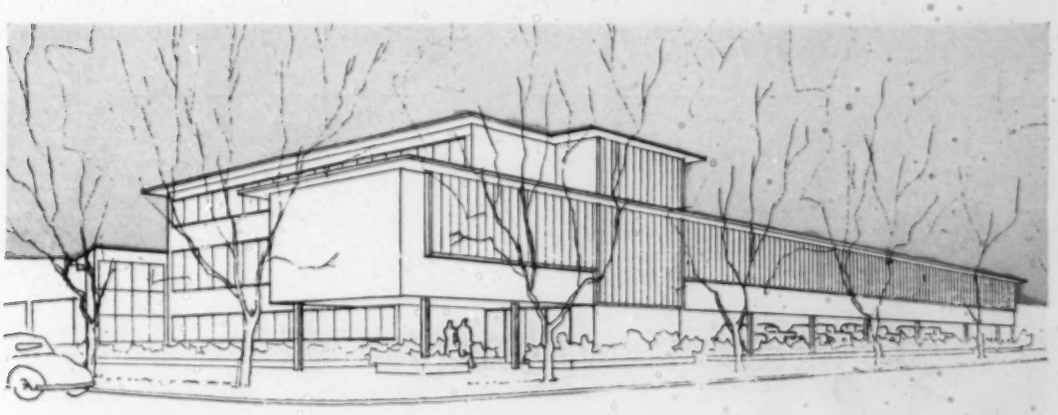


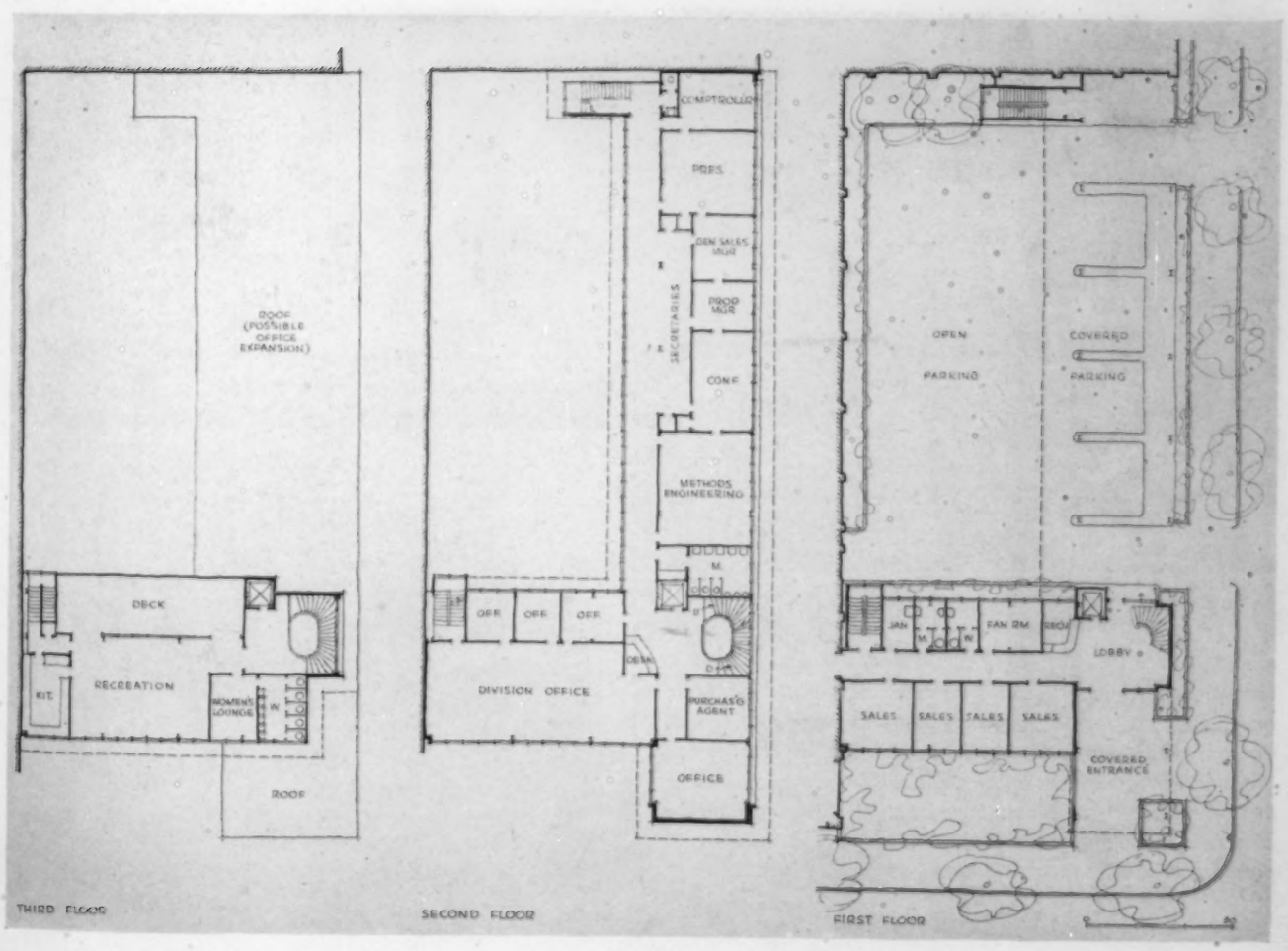


Wurster, Bernardi and Emmons, Architects

ELEVATED BUILDING PROVIDES PARKING

HERE again is an instance in which parking becomes perhaps the major determinant in the planning of an office building. Here presumably the sacrifice was less than in a previous example, since this is an office project for an industrial concern. In any case the now-familiar device of elevating the building works out nicely to provide covered parking and entrance ways, and at the same time to lift the working offices above the distractions of the street level, also to give them better daylight.

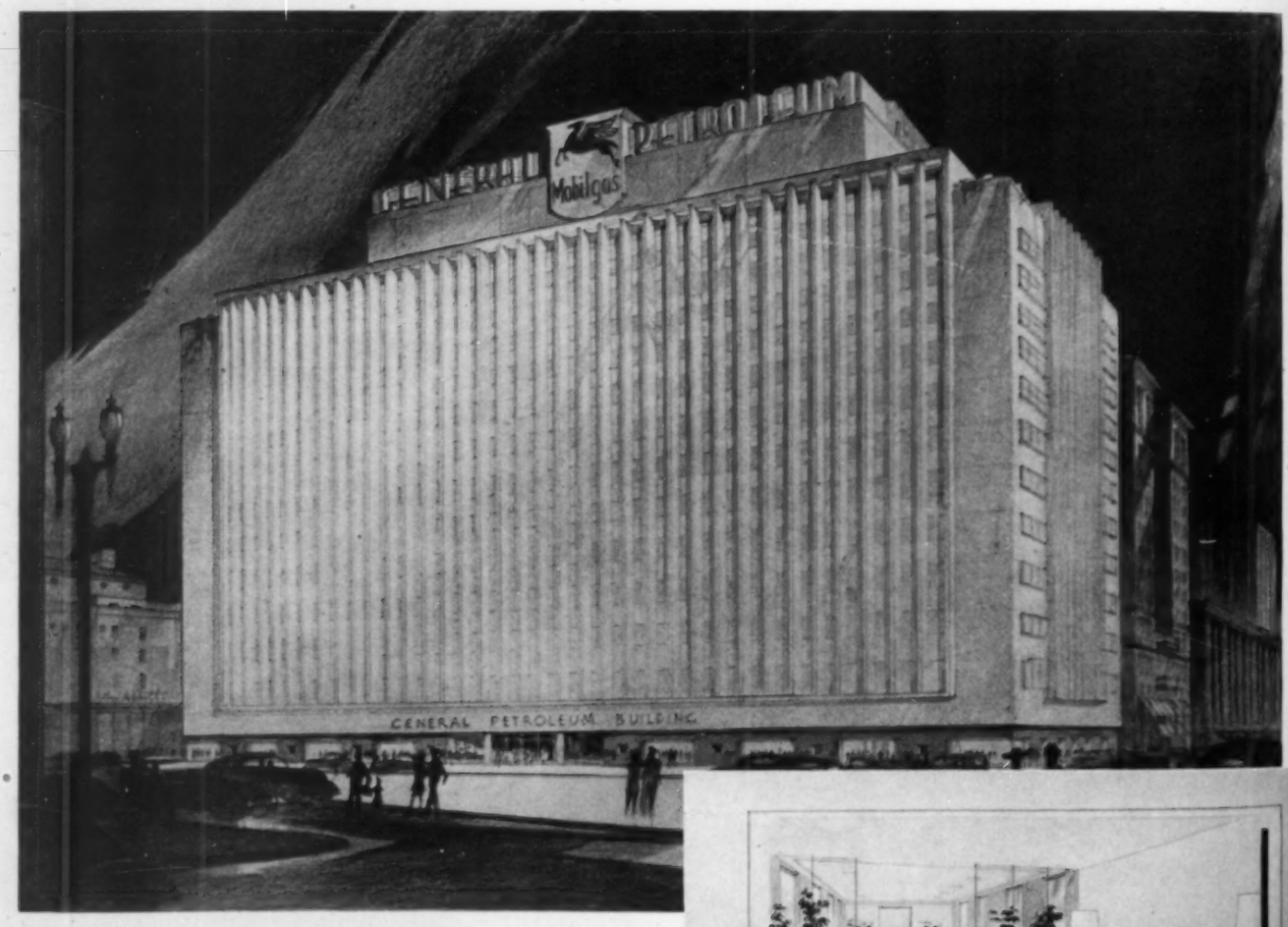


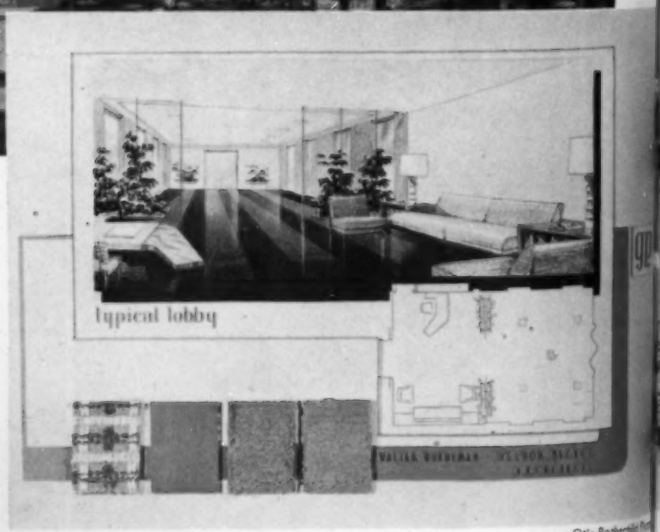


Walter Wurdeman and Welton Becket, Architects

GENERAL PETROLEUM BUILDING, LOS ANGELES

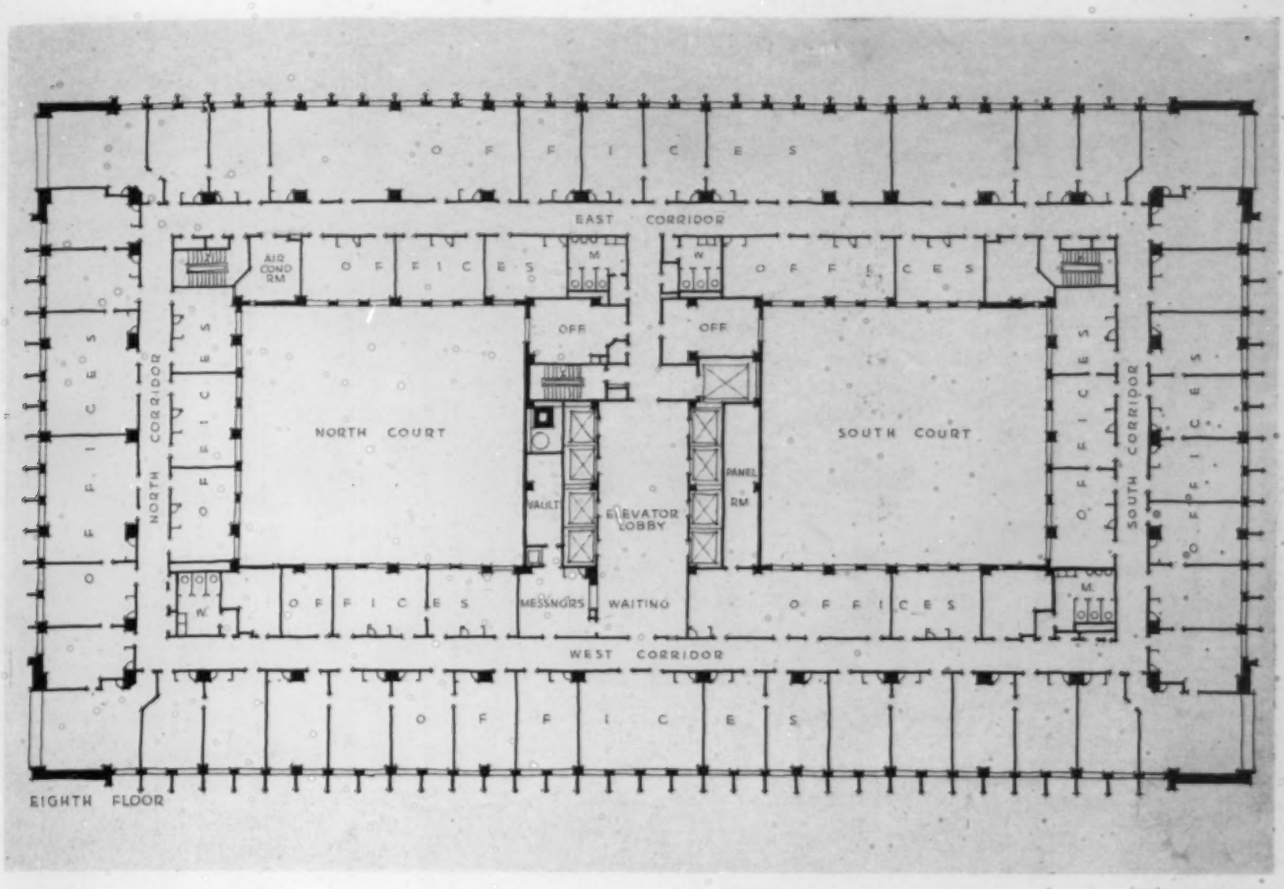
WITH calm modesty the architects write: "this building does not radically differ in concept from office buildings of the past except that it features thin aluminum fins for sunshades, removable office partitions, and an extremely light steel frame, considering our earthquake ordinances. Because of high land values the problem was to condense the plan to obtain maximum floor area in the height allotted, 150 ft. For this height, setback is impractical and unnecessary. The plan is laid out in 7-ft. modules, interior office partitions are movable so that offices can be laid out in any multiple of 7 ft., and a window is provided in each module." With all this, parking is not neglected: a separate garage is to be constructed near the building, on a site already owned by the company.



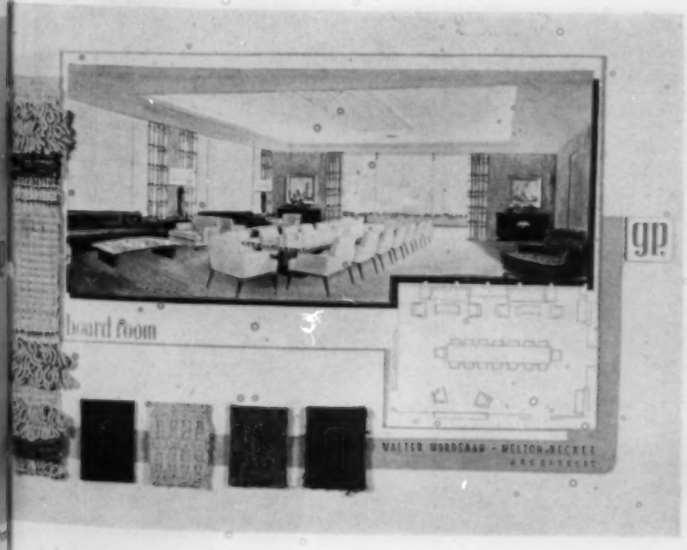


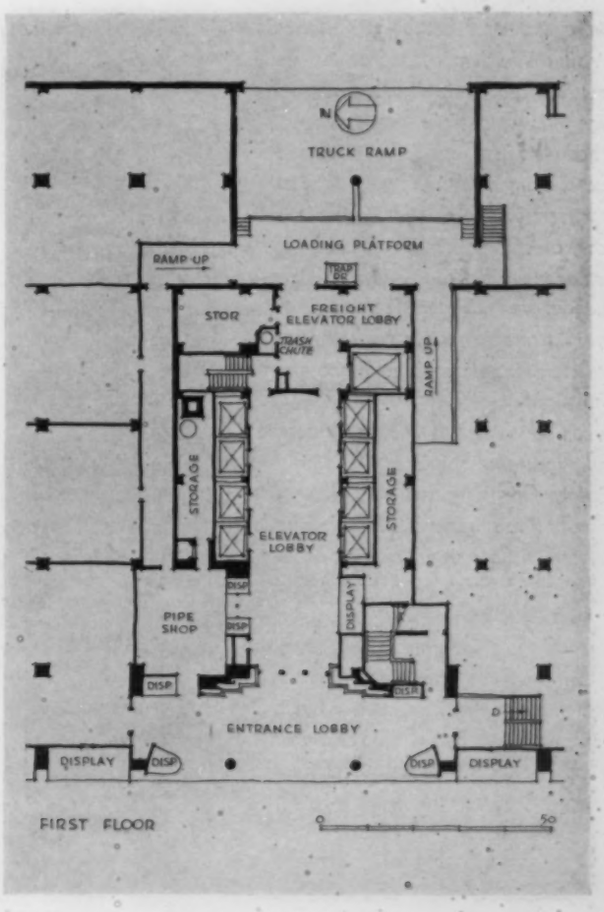
typical lobby

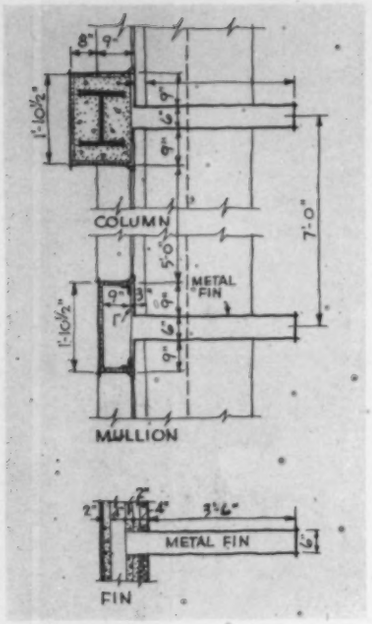
Simplicity depending on color is the theme of this building. Main body of the building is warm gray-beige terra cotta. Spandrels are gray-green terra cotta, and the base is of black granite. Fins are aluminum, grooved vertically to eliminate glare; all exterior trim is "alumilited" aluminum. Interiors also will show studied use of color. Incidentally, presentation renderings of interiors (right) are done in color, and include actual samples of fabrics



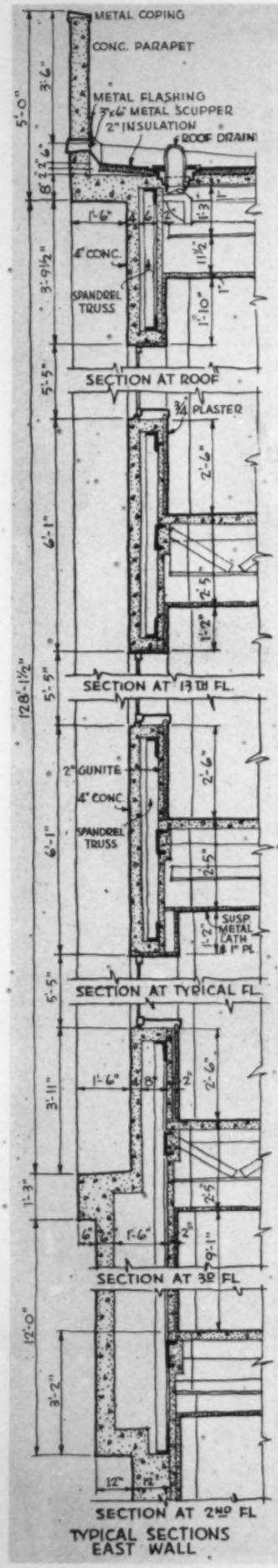
"The building is oriented so the main façade faces west and slightly north. As our sun problem in California is mainly on the west and south, a grid system of fins was devised to keep sun off the glass. A fin at each 7-ft. module, or at each window mullion, provides shade on the west façade through the hot period so as to save 300 tons of refrigeration by limiting impingement of direct sun on glass"

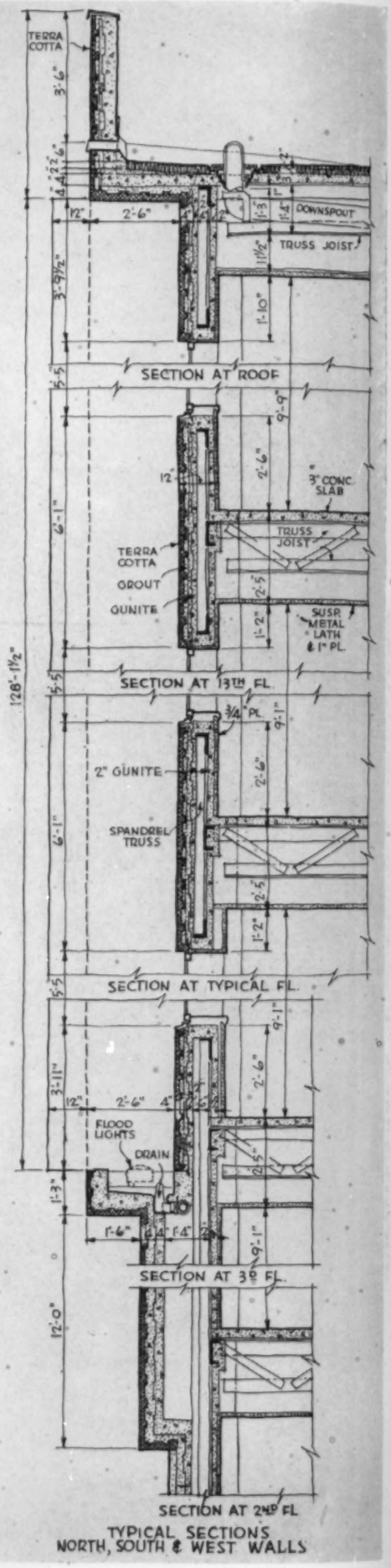






"The structural frame system," writes Walter Wurdeman, one of the architects for the General Petroleum Building, "is unique in that all concrete above the first floor, is lightweight concrete, using rocklite, pumice or similar aggregate. The exterior walls are hollow, a combination of lightweight concrete inner walls and lightweight gunite exterior walls. Material savings in dead weight of construction and tonnage of structural steel result from the use of the lightweight concrete. We have taken advantage of the recently-enacted ruling of the Board of Building and Safety Commissioners regarding fireproofing requirements of Type 1 buildings. The floor panel systems are steel joists and concrete slab constructions, a type which heretofore has been prohibited in California. The structural spandrels are fabricated steel trusses which use the hollow exterior walls for fire protection. Fins will be of aluminum encasing vertical structural steel trusses."

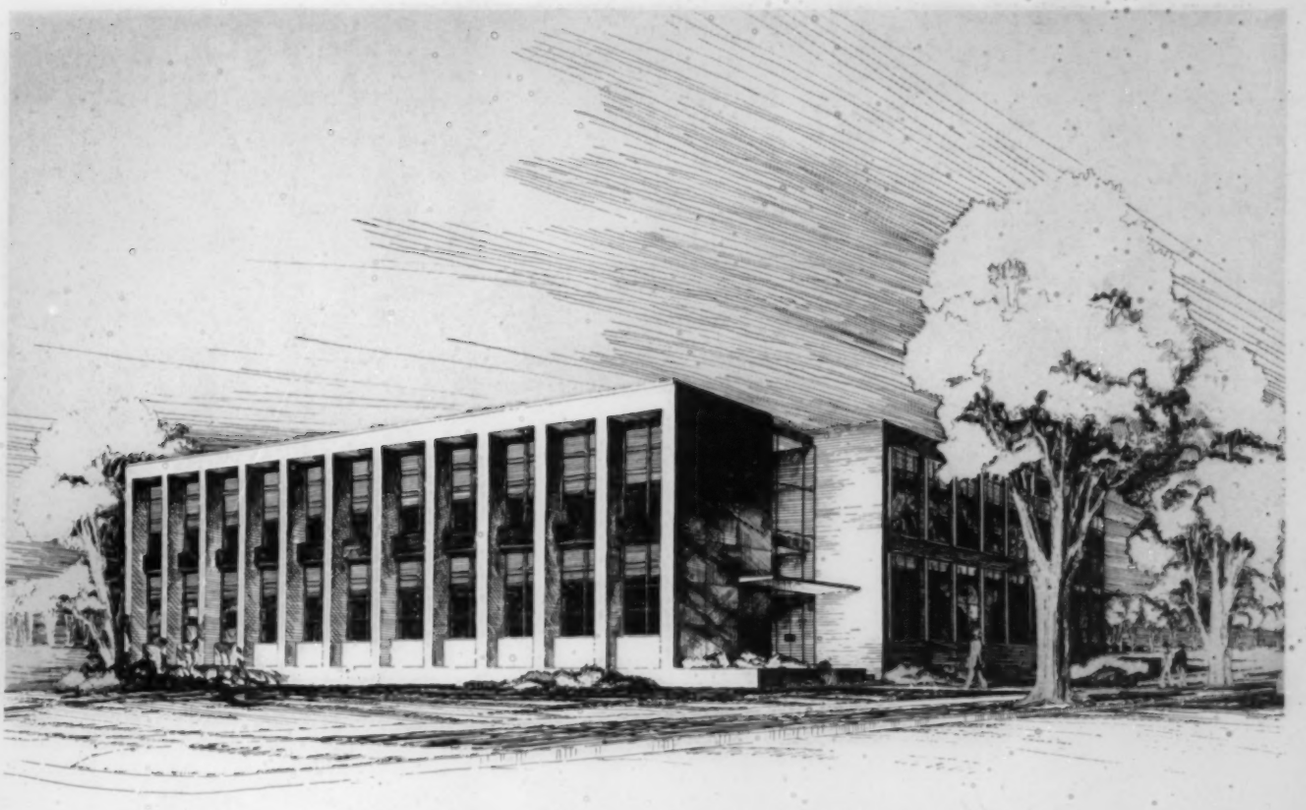


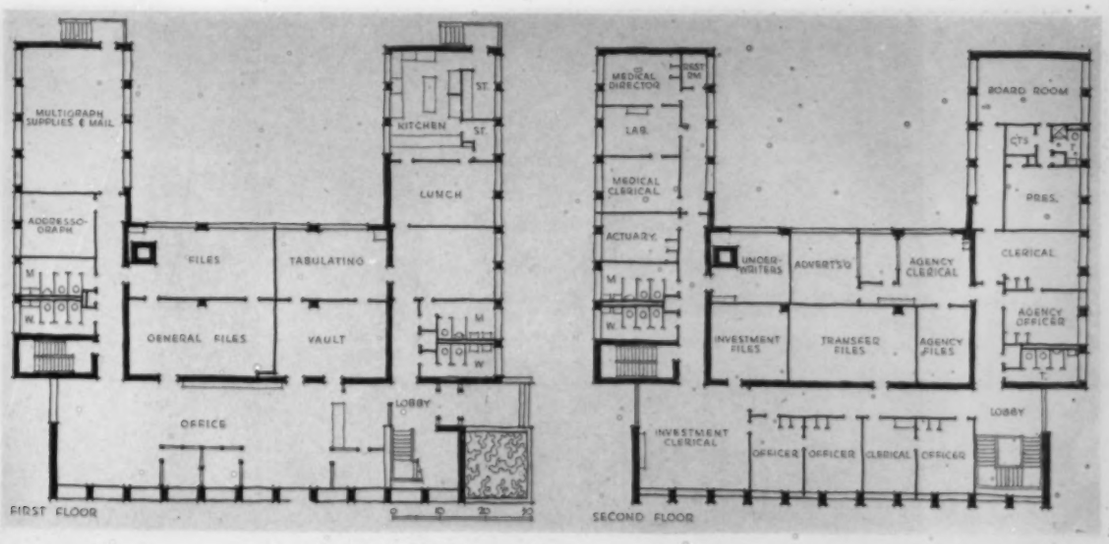


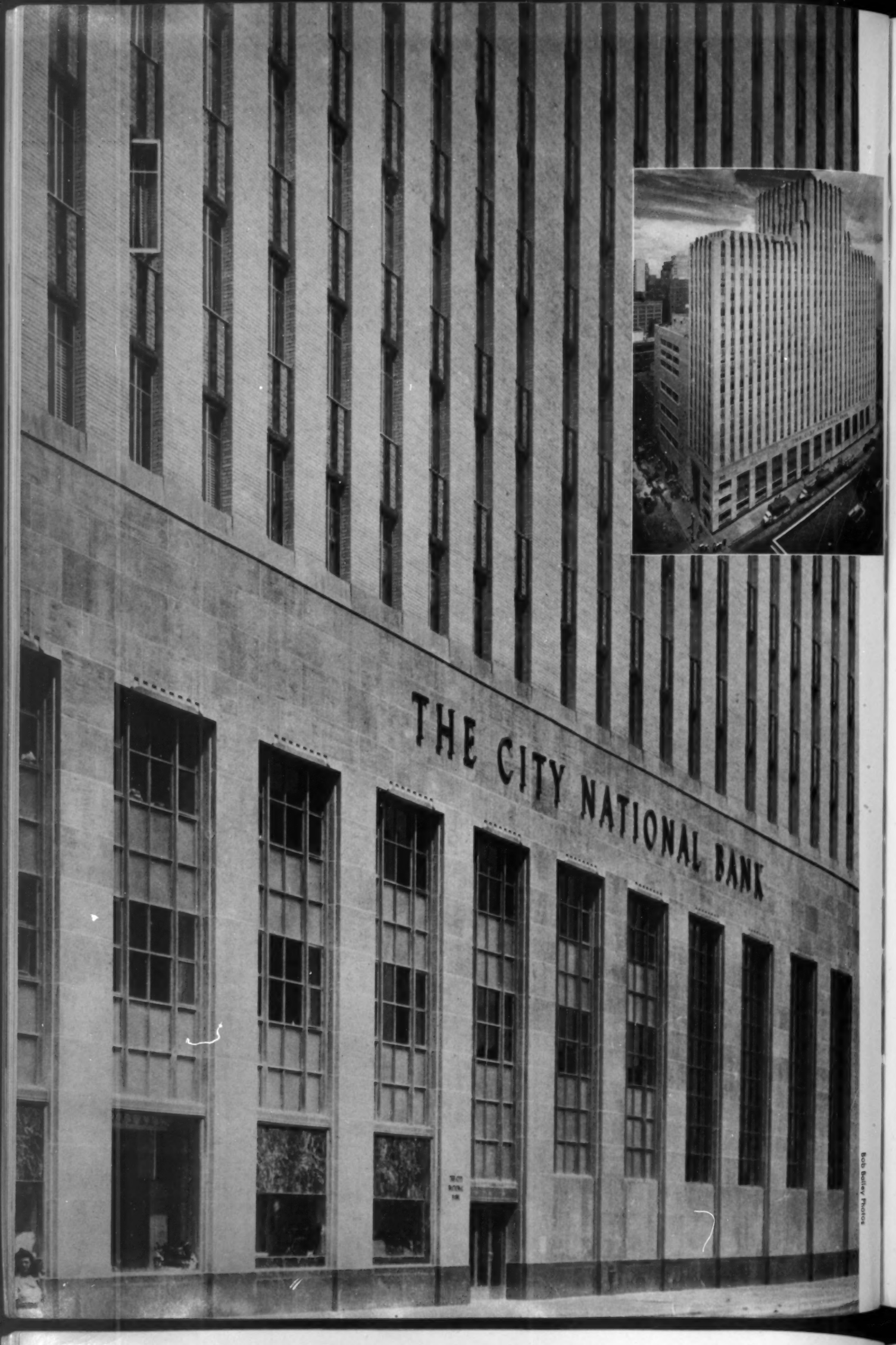
Skidmore, Owings & Merrill, Architects

INSURANCE OFFICES AVOID THE COLONIAL

THE tradition that an office building for a life insurance company must be in Colonial style was one of the last to go. But here is evidence that an insurance office building can violate the tradition. This one is now under construction in Indianapolis for the Standard Life Insurance Company of Indiana. If there is some suggestion of classicism in the deep reveals on the west façade, nobody need make any false assumptions about styling intentions. The deep piers shade the huge windows through much of the day, and make it unnecessary to use the venetian blinds except for the worst hours of western sunshine.



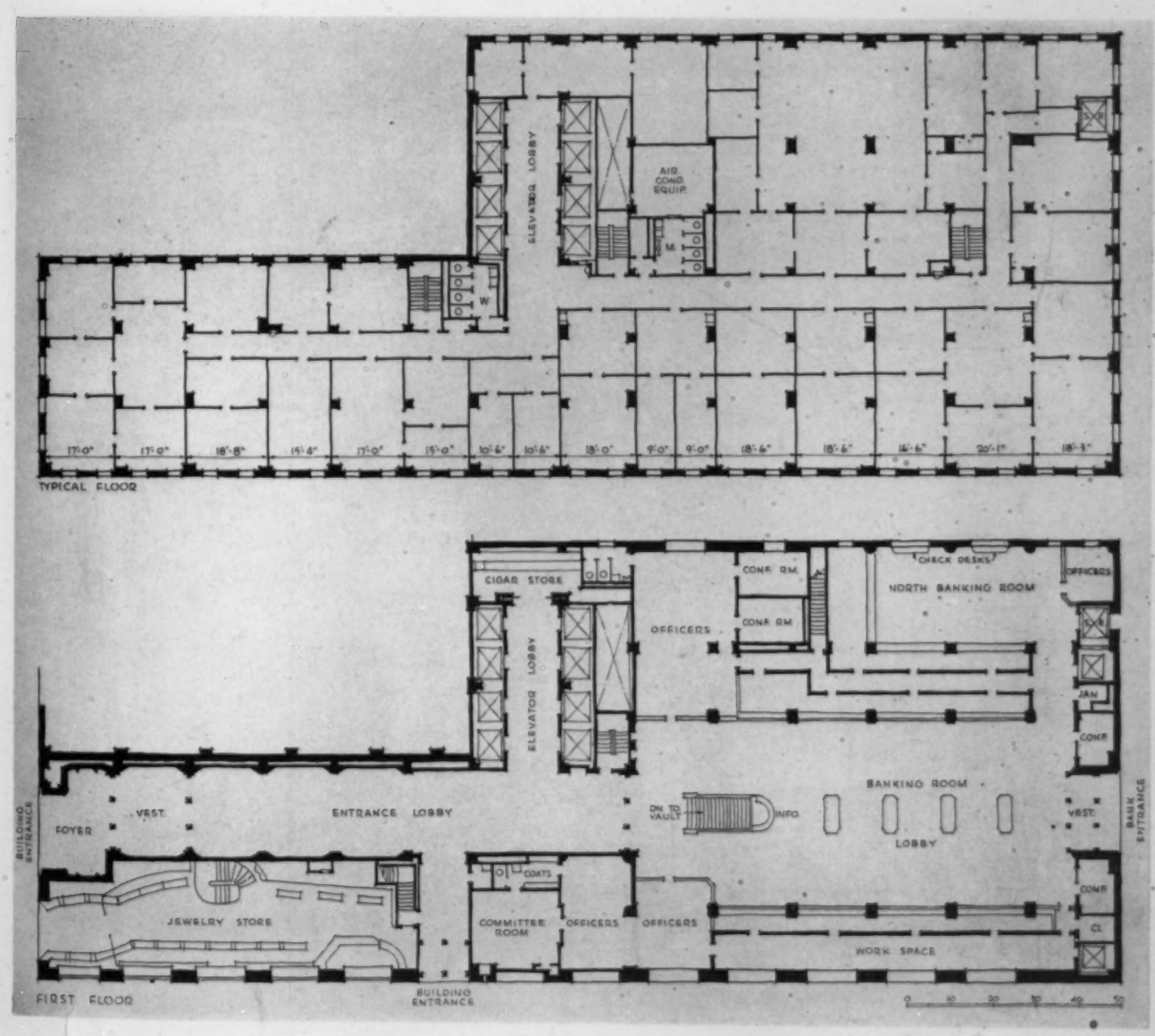



THE CITY NATIONAL BANK
Bob Bailey Photos

Alfred C. Finn and Robert J. Cummins, Architects and Engineers

CITY NATIONAL BANK BUILDING, HOUSTON

IF it is true that American cities can no longer afford the towering office building, this negative philosophy has not been accepted in the busy Southwest. For this bank building, too new to be ready for any interior photographs, stacks up quantities of office space atop a huge banking room in a familiar American pattern, and bears witness to the rapid growth of the bank headed by Judge James A. Elkins, which was founded in 1924, when the great eastern banks were already building their skyscrapers. Building progress in the interim, however, is visible in this new model. Air conditioning, for example, makes possible a logical development of a plot which would have proved difficult years ago, for the deep space, air conditioned and well-lighted, now proves very usable. Column spacing on the typical floor plan indicates good flexibility in the division of the space, something lacking in many older buildings.



Bob Bailey Photos

Wyoming Valley Veterans' Building, Wilkes-Barre, Pa.

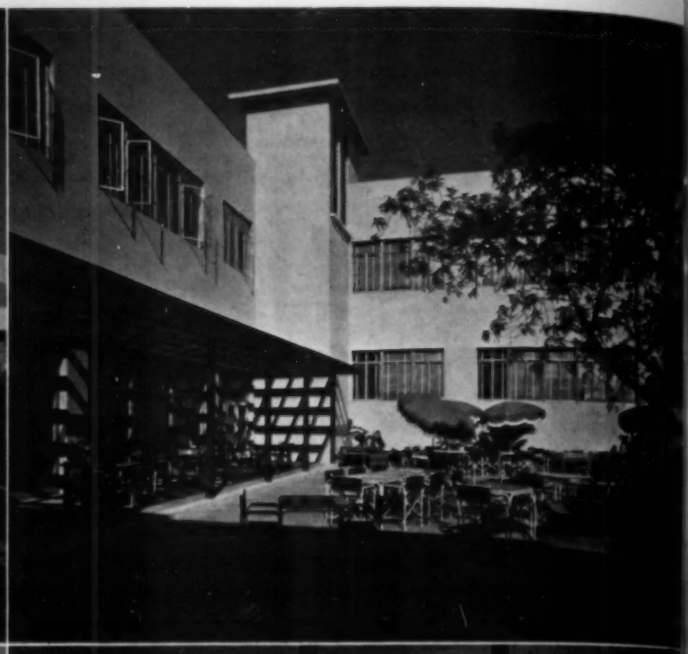
Ace Hoffman Photo

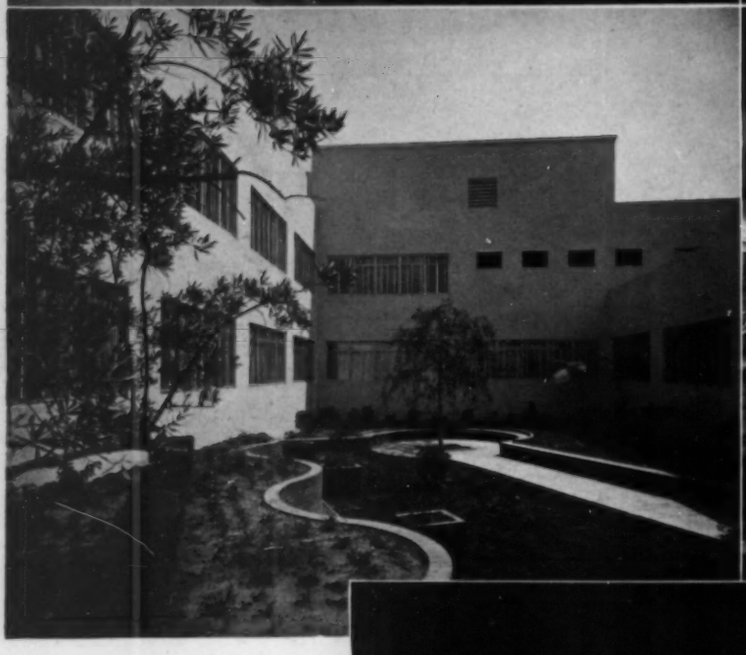
Lacy, Atherton, Wilson & Davis, Architects and Engineers

ECONOMICAL SPACE FOR V. A. OFFICES

FOR an office building of institutional character, this one represents a rapid and economical solution for a timely problem. The Veterans Administration regional office, established in Wilkes-Barre at the end of the war, was hard put to find office space, and had to scatter into a number of different locations. This building was a citizens' response in fund-raising and 24-hour planning to house the VA, coupled with record-breaking construction in the worst strike months of 1946–47. The completed building contains 165,000 gross sq. ft., and the cost, including fees, was $1,120,000 or 60¢ a cu. ft. The building provides mass office space in simple design. Construction is reinforced concrete, with grid flat slab floor in a patented system using inverted square pans for voids. Concrete generally is left exposed, painted on the interiors. Exterior is common brick.

OWL DRUGS





REXALL
DRUG
COMPANY

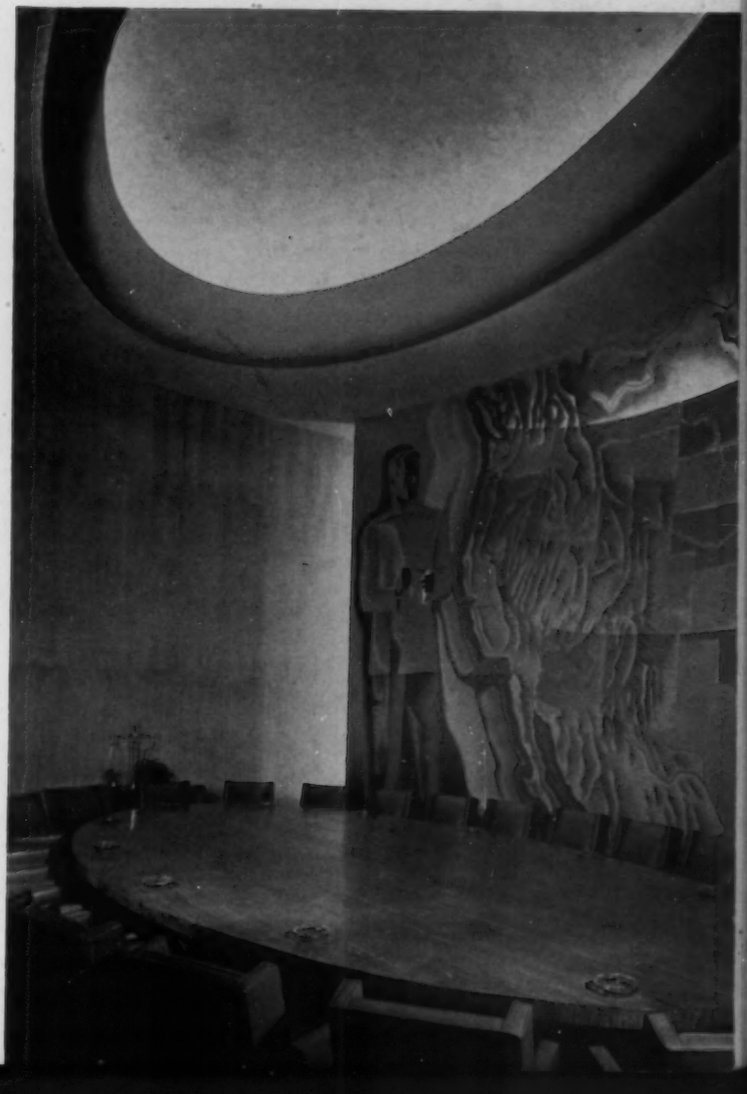
Albert F. Roller, Architect

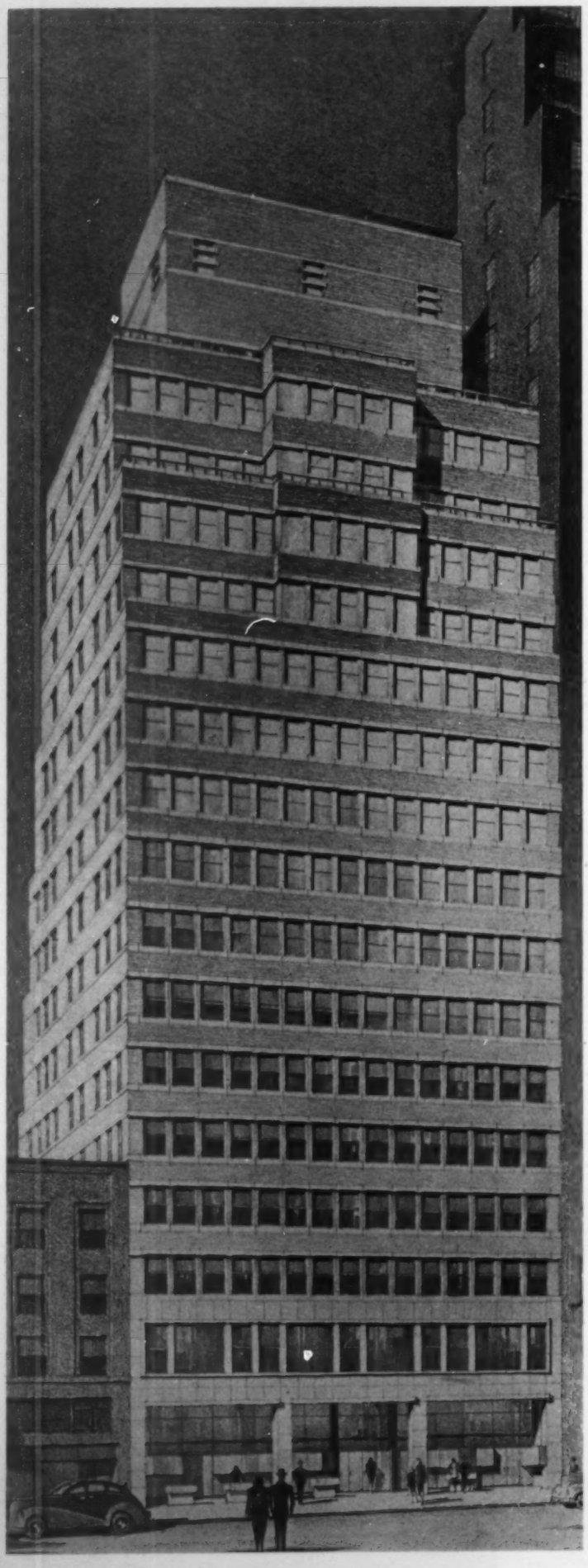
REXALL DRUG HEADQUARTERS IN LOS ANGELES

SEEN from the air, the "world's largest and finest drug store" demonstrates how completely the automobile dominates the commerce of Los Angeles. For here is a drug store practically unapproachable by pedestrian traffic. If, indeed, the surrounding area supplies any pedestrian traffic. Of course this building is primarily an office building, housing headquarters of the Rexall firm, but nevertheless much of its space is devoted to a sort of test store for company products, and as such must depend virtually entirely on automobile traffic, something almost unheard of for a drug store. The building itself covers three acres of a six-acre site, the balance being parking area for 300 cars. Four interior light courts, or patios, have been developed for rest spots for employees in rest periods. The building will be entirely air conditioned, having the largest office installation on the West Coast, with two 250-ton compressors. As another evidence of new standards of office space, some 70 per cent of the interior areas have been treated for acoustics, reducing noise of machines, typewriters and conversation by 80 per cent. The exterior is of architectural concrete; the architect mentions his wish to express the long horizontal lines in a continuous form rather than as a veneer with joints.

Below left: Fountain room in Owl Rexall "super drug store" has picture windows, seats 225; ceilings and walls are sand-color acoustic plaster. Executives' dining room features picture window with trellis outside. Reception room (opposite page) has chocolate brown walls; lobby walls are rich green. Stair foyer (far right) is lighted by recessed, louvered lights and endless neon tubes hidden in coves above

Above left: one of the long corridors; there are nearly two miles of them in the building. Only the private offices are partitioned; secretaries' spaces are screened from aisles by plywood railings. Employees' dining room doubles as auditorium; sliding screen hides serving counters. President's office (opposite page) is paneled in bleached black walnut. Directors' room (far right) has mural done by Don Clever

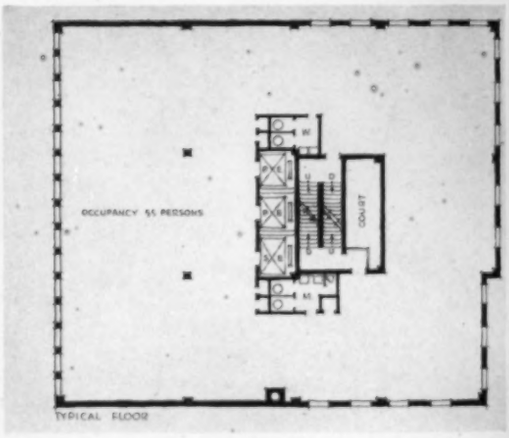


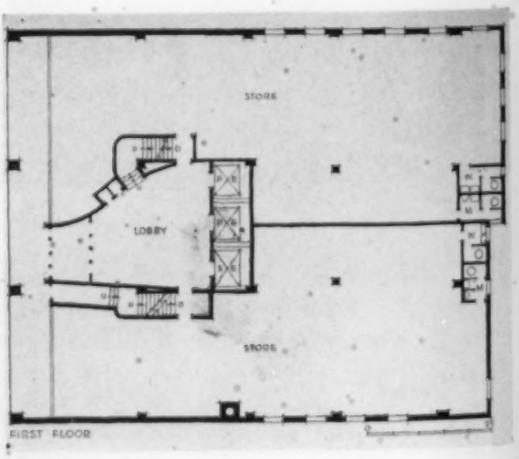


Charles N. & Selig Whinston, Architects

SAVING SPACE IN A LOFT BUILDING

A RECENT version of the typical New York City loft building for merchandising tenants, this one shows new attention to the dual considerations of light and space. Fortunately situated with respect to surrounding buildings, it was planned to develop all possible outside space, with service core back in the center. An ingenious arrangement of the fire stairs and fire tower and court saves 100 sq. ft. of rentable area per floor. Stairs follow the "scissors" scheme. Since the fire tower must be enclosed with four-hour fire protection, soffits of all stairs will have a coat of metal lath and vermiculite plaster.





BUILT-IN AIR CONDITIONING

New York's newest office building boasts central and controlled system for air cooling in summer, air tempering in winter

News accounts of the Universal Pictures Building attribute to its air conditioning system "the cooling effect of a column of ice six miles high and 1 ft. square, melting every day." No one will find a solid core of ice running upward through the 22-story building, but the statement gives an idea of the cooling capacity of its 1000-ton refrigerating system that circulates chilled water to fan rooms on each floor, from which cooled and dehumidified air is circulated to offices by ceiling ducts. In winter, warm tempered air is circulated through the same system of ducts for good ventilation and to augment the heating effect of convectors, by preventing indrafts at windows.

This is the first fully air conditioned office skyscraper in New York, and the first large office building completed there since the war, occupying an entire block frontage on the east side of Park Avenue between 56th and 57th streets. During construction, it was known as the Tishman Building.

The cooling effect is produced by two carrier centrifugal refrigeration compressors powered by two steam-driven condensing turbines. The air conditioning system has a separate control station on each of the 22 floors. Each station contains its own system of fans, cooling coils, heating coils, and filters through which the air is circulated.

Although a few of the tenants presented special problems — restaurant, beauty shop, etc. — the air conditioning system was designed primarily for offices following a general pattern of private

Seidman Photo

The recently completed Universal Pictures Building on Park Avenue in New York (formerly called the Tishman Building): Kahn and Jacobs, Architects; Jaros, Baum, and Bolles, Consulting Engineers; Fred N. Severud, Structural Engineer; Tishman Realty and Construction Co., owner-builder; Kerby Saunders, Inc., contractors for air conditioning equipment, Atlas Sheet Metal Co., ductwork

offices around three sides of the building and large open office space in the interior areas. Elevators, fan room and services occupy most of the fourth side of the building.

Preliminary studies by Jaros, Baum, and Bolles, mechanical engineers, considered a "peripheral" system of ducts rising inside the exterior walls (from refrigeration and fan rooms in the basement). This idea was discarded, however, because of (1) too great extent of interior areas, which would require separate inside ducts; (2) varying office layouts and requirements on separate floors; (3) the effect of sun and shadow on different levels of the same building face; and (4) inadequate space for vertical ducts at exterior walls and offsets. It was decided therefore that each floor should have its own fan room; and that the several parts of each floor should be zoned separately, instead of zoning the building vertically.

For reasons of overall economy in design and materials, fan rooms for all floors have the same type of equipment and layout, and identical connections for steam and chilled water, although the systems on the smaller upper floors have smaller fans, coils, and ducts to suit the reduced cooling and ventilating requirements.

Each floor is divided into five zones: (1) north periphery (north is actually northeast, so receives early morning sun); (2) west periphery (receives direct afternoon sun); (3) south periphery (receives mid-day sun); (4) and (5) interior areas on the north and south sides.

Separate ducts lead from the fan room to each of these zones. In many cases, an entire floor is leased to a single tenant with special requirements for partitions and floor layout. While these variations required minor modifications in duct design and changes in location of grilles, major duct layout and zoning remain the same.

A modular system of grilles is provided on ducts supplying peripheral zones (1 grille to every two windows) so that partitions may be relocated without affecting the air conditioning.

Three types of controls are provided to prevent over-cooling. Ducts supplying interior zones have volume control only, in the form of dampers operating fully open to two-thirds open. Ducts supplying north and south zones have volume control and a reheat coil in zone ducts. The duct supplying the west zone has volume control, reheat coil, and also an after-cooling coil to give extra cooling effect required when sun is on that side of the building in late afternoon.

Air temperatures are regulated by indoor thermostats that respond to the thermal effect of increased sunshine, lighting, or increased number of people in the zones they control. These thermostats are automatically reset by an outdoor thermostat, to give comfort and operating economy under changing weather conditions.

Air cooling goes into effect when outside temperature exceeds 70°. Then, for every 2½° rise in outside temperature, inside temperature is raised 1°. At 95°, considered the maximum practical design temperature for New York City, temperature within the building is maintained at 80°.

Dehumidification of circulated air keeps relative humidity at 50 per cent or below in the summer. There is no humidification of tempered air in the winter because windows have only a single thickness of glass, with danger of frosting.

Refrigeration Room

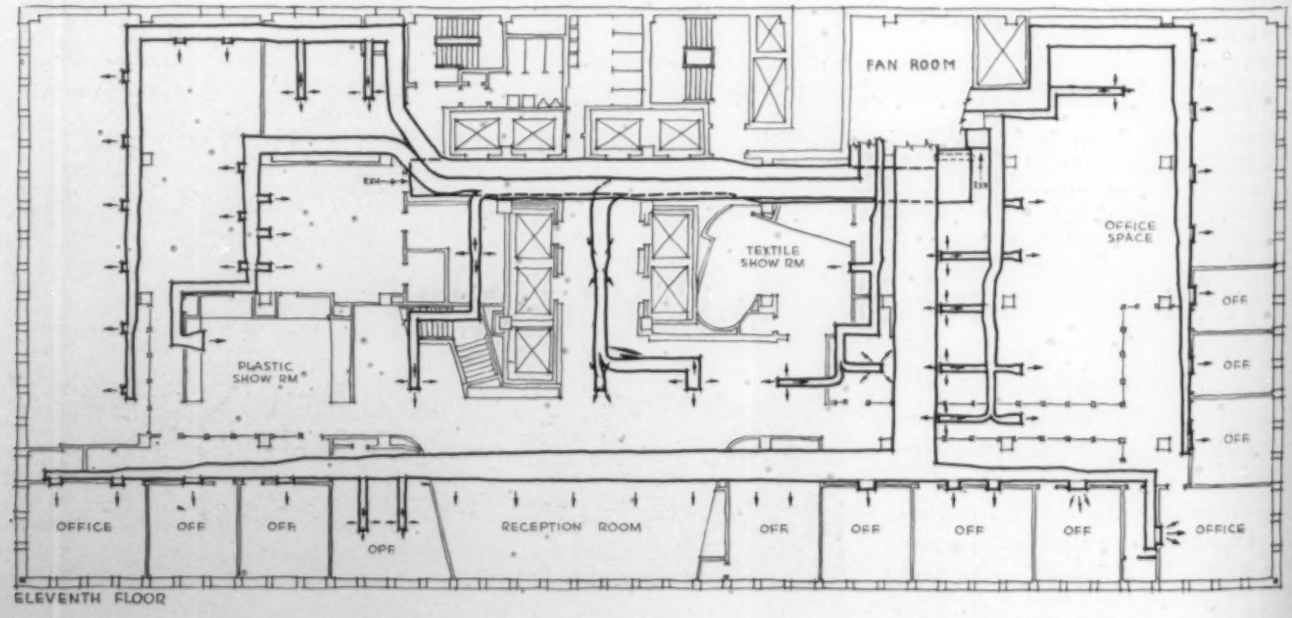
It was considered impractical to install individual refrigeration rooms on each floor in conjunction with the fan rooms. Not only would space requirements and structural loads be increased, but also initial cost and maintenance problems. Then, too, economical steam-driven machines could not have been used.

The refrigeration room in the basement is equipped with two 500-ton refrigerating machines (compressors), each capable of maintaining one-half of the maximum refrigerating load. They are designed to be driven by steam supplied from an outside source at 125 lb. per sq. in. pressure (or by a boiler plant in the building, if later installed).

During spring and fall, one of the machines will suffice, operating well loaded at a cost materially below that of a single larger machine only partially loaded.

As an economy factor, water from the cooling tower, after condensing the refrigerant, is used to condense steam from the turbines. This reduces steam consumption by about one half.

Ceiling ducts which supply cool dehumidified air in summer and tempered air in winter, from fan rooms on each floor, generally follow this pattern on all floors, with minor modifications to suit individual requirements (floor shown will be occupied by Monsanto Chemical Co.). Floor area is divided into five zones: three peripheral zones and two interior zones. North side of building is at left



ELEVENTH FLOOR

DESIGNED FOR GERM CONTROL

Memorial Laboratory of Infectious Diseases, Bethesda, Md.; designed and built by Public Buildings Administration (W. E. Reynolds, Commissioner of Public Buildings; C. David Persina, Chief of Design Division; Robert Mayo, Jr., Chief Mechanical Engineer)

EVERY technical skill in planning, ventilation, lighting, and other services was marshalled in the design of the Memorial Laboratory of Infectious Diseases at Bethesda, Md. Within this building is an arsenal of deadly germs for medical research, which in former obsolete quarters claimed the lives of six laboratory workers.

The problem presented to the planners of the new laboratory was in many ways unique: how to design a building that would give the greatest possible protection to scientists working with virus disease germs in the search for serums and vaccines. In large part, that meant controlling the air currents, for germs ride particles of dust in the air. Infection by direct contact can be lessened by simple precautions, but avoidance of airborne infection needs elaborate mechanical aids.

Each of the three upper floors contains a laboratory unit in each wing, separated by a "clean area" containing elevators, foyer, storage room, office and library.

Laboratory units are entered through a decontamination lock, with duplicate facilities for men and women. As part of the elaborate ventilation system, negative air pressure is maintained in these areas to assure that air flow will be inward from the central "safe" areas. Decontamination locks have a vestibule with lockers to receive street clothes; beyond is a shower, leading to a second locker room for laboratory clothes.

In each general laboratory, there are cubicles equipped with microscope tables and work tables. Over each work table is a hood equipped with a glass panel for observation and an open slot at the bottom to admit the worker's hands. Negative air pressure is maintained within the hood; and air is passed upward through an exhaust duct leading to an electric grid that destroys airborne germs at a temperature of from 500° to 650° F., so that air discharged from the building will be germ-free.

Focal points of deadliness are the special work rooms with cabinets for high-speed blenders and centrifuges. A fine invisible spray may result from these operations — the grinding or separation of infected fluids and tissues at 75,000 revolutions per minute. Therefore, doors to cabinets have a switch that cuts off the current when they are opened. Within the cabinets, negative air pressure is maintained and exhaust air is passed over hot grids before venting outside the building.

Special rooms in pairs are also provided for controlling temperature and humidity. In the cold room, temperature can be maintained as low as 0° F. There are also dissecting rooms, animal rooms, and space for the general cleaning and steam sterilizing of animal cages and other laboratory equipment.

To prevent cross-contamination from one laboratory to another, a separate dumbwaiter is provided for each, to carry refuse containers to the incinerator charging room below.

The windows in laboratories are hermetically sealed with 3-ply glass that insulates against heat, cold, dust, and moisture. Interior walls are of concrete, faced with ceramic tile, except for a few glazed wall units. Laboratory floors are of ceramic tile; other floors of quarry tile or asphalt tile.

Air Conditioning

Air is taken from outside only, and after passing through filters, preheaters, surface dehumidifiers, and cooling coils, is delivered directly to the plenum chambers. In winter, air is warmed by steam coils. From the plenum chambers, individual ducts run to the conditioned rooms. Air outlets are of the circular diffuser type, except in laboratories where perforated plate outlets are necessary to avoid setting up air currents at walls. Outlets in laboratory cubicles are provided with additional filters.

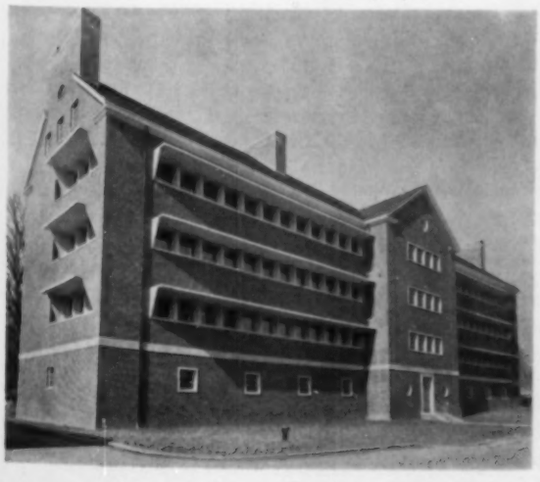
As mentioned before, total laboratory exhaust exceeds the supply, so that air flows in from corridors, thus minimizing the escape of organisms. No air is recirculated.

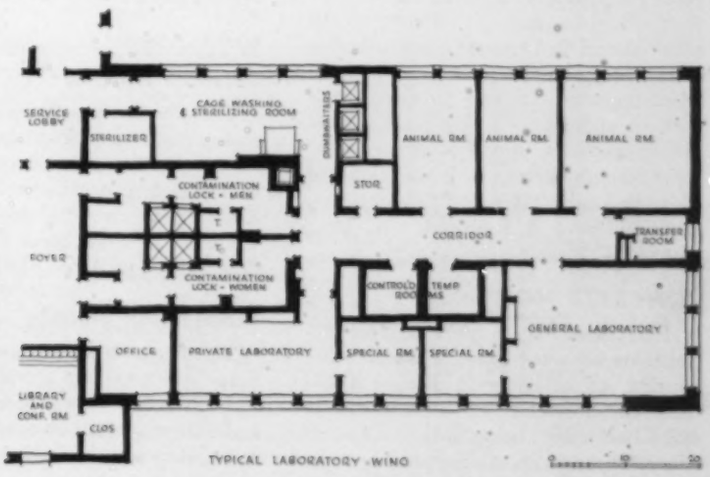
Lighting

Precautions taken against contamination in other features of the building are carried out in connection with the lighting equipment. General illumination in "sealed off" areas is provided by specially designed recessed fluorescent units sealed in a frame, which is installed flush with the plaster ceiling. Edges of lens frame are beveled to provide a minimum of crevices in which bacteria can lodge. This also facilitates wiping with a disinfectant before breaking seal between frames in relamping the units.

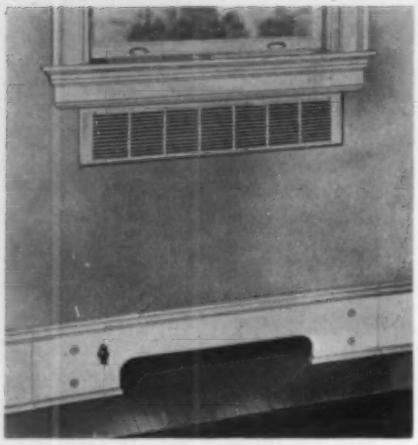
Cabinets for centrifuges and hoods over work tables are equipped with shielded germicidal lamps to kill germs adhering to inner surfaces.

New laboratory of National Institute of Public Health for research in deadly virus disease germs. Plan of typical wing shows laboratory layout, separated from "clean" area by decontamination locks. Negative air pressure creates inward flow from uncontaminated area





PRODUCTS for Better Building



Convector unit is concealed in the wall

CONCEALED CONVECTORS

Webster System Radiation for controlled steam heating now permits the concealing of convector units within walls. Heating element, supply valve, return trap, and union connections are combined in a single compact unit. The sheet metal enclosure for the heating element has openings at top and bottom for natural convected air movement. Provision is made for positive heat control by extending the valve handle through the enclosure, permitting complete shut-off. There is a wide range of radiator sizes in each of five types of enclosures. The system can be orificed for use as a component of low-pressure two-pipe Webster Moderator systems of steam heating, either vacuum or open return. It cannot be used with hot-water heating or one-pipe steam systems. Warren Webster & Co., Camden, N. J.

MASONRY COATING

A new type of masonry coating, *Para-StoneTex*, has a chlorinated rubber base that is said to render it immune to the alkali found in concrete, and asbestos siding and shingles. Other announced advantages are its ease of application without appearance of lap marks, good hiding qualities, speed of drying, and resistance to water. It is available in white and colors. Truscon Laboratories, Div. of Devoe & Raynolds Co., Inc., Detroit 11, Mich.

CONCRETE HOUSES

Atlas Speed Forms, made of steel sections, are reported to make possible the pouring of all-concrete houses (one-story two-bedroom) at the rate of one and a half a day, using only two sets of forms. These forms are supplied in complete sets for pouring an entire house, including exterior walls, interior walls, and roof, and are made up of units that are assembled with wedge bolts and clips.

Studding is not required for support of the wall. Wale seats fastened to the forms carry walers of 2 by 4 lumber. Standard snap wall ties keep the forms the specified distance apart and tie wedges secure the walers.

The steel slab forms used for the roof are also said to be simple to set and strip, since they do not require joists for support, nor any form of fastening. The steel slabs lay flat on girts and the panels form a tight joint through which concrete will not pass. Irvington Form & Tank Corp., Irvington, N. Y.

FLUORESCENT LIGHTING

Shielding Fluorescents

A *Conversion Set* has been announced for shielding bare fluorescent lamp fixtures already mounted. The set contains a shield frame assembly, glass panels or louvers, retaining clips, joint covers, mounting bracket or hook, and hardware. Installation is said to be easy and to require a minimum of adjustment. Sylvania Electric Products, Inc., 500 Fifth Ave., New York, N. Y.

Slimline Series

The *Linolite Slimline Series* of fluorescent fixtures are made in two-lamp and four-lamp units, with hinged louver frames that provide 45° crosswise and 30° lengthwise shielding. Framed glass sidepanels illuminate ceiling areas to reduce brightness contrasts. Matching spotlight and downlights are available for combination and accent lighting. The Frink Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.

WINDOWS

Bedroom Window

The *Fenestra* steel window for bedrooms features an in-tilting vent at the sill which deflects air currents toward the ceiling and protects opening from rain. Above the vent is a double casement window. Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit 11, Mich.

Hidden Sash Balance

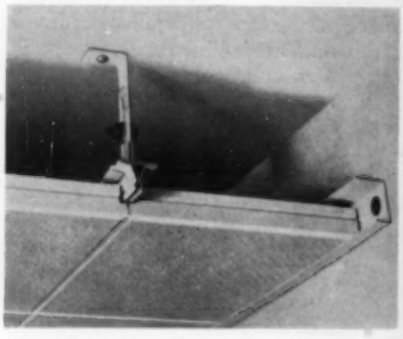
The *Invizible sash balance* for double-hung windows is a spiral counter balance attached to and concealed in the sash. The balance consists of a helical coil spring within a rotative spiral tube, which operates through a brass bearing and moves with the sash. There are no exposed tubes, and tapes and cables are eliminated. Grand Rapids Hardware Co., Grand Rapids 2, Mich.

Industrial Window

Lok'd Bar Steel Factory Sash is designed for greater strength and weathertightness in industrial buildings having large glazed wall areas. Ventilators are hung on heavy steel side arms pivoted to the frame at the jambs on pairs of solid bronze pivots. Weight of the section is heavier and strength of the joint is quoted as double that of conventional sash. Hope's Windows, Inc., Hopkins Ave., Jamestown, N. Y.

COTTON INSULATION

Cellulite, a flameproofed cotton building insulation, now comes in an enclosed envelope in standard widths and lengths. One side is a vapor seal and the other a tough paper covering to facilitate handling. This packaged Cellulite is known as Type E to differentiate it from the regular Type II Cellulite which has the vapor seal only. The Gilman Brothers Co., Gilman, Conn.



Acoustical panel with mineral wool filler

ACOUSTICAL PAN

A new metal pan acoustical unit, known as *Arrestone*, is now on the market. The perforated metal pan contains a flameproof paper-wrapped mineral wool pad which is held away from the perforated surface so that its entire surface acts as a sound absorber. Arrestone measures 12 by 24 in. with a bevel on all face edges and one dividing the pan to give the appearance of two square panels or tiles. Perforations are in a diagonal pattern. Unperforated pans without absorbing pads are available for use in borders or special designs. The metal pans snap onto rigid steel T-runners and can be removed easily. Weight is 2 lb. per sq. ft.; finish is baked enamel which can be washed and, when necessary, repainted without affecting acoustical efficiency. Noise reduction coefficient is quoted as .85. In addition, the mineral wool pad is said to provide thermal insulation. Armstrong Cork Co., Lancaster, Penn.

(*Continued on page 172*)

DOCKING FACILITIES FOR MOTOR TRANSPORTS

By Fruehauf Trailer Company, Detroit.

The primary consideration in planning modern loading and unloading facilities for motor transport equipment is to provide adequate space for efficient maneuvering into and out of loading position at properly constructed docks. No one plan will fit all requirements, but careful study of present needs and future possibilities will determine the type and size of facilities essential to efficient operation.

There is, of course, no set of standard dimensions covering the space required for maneuvering the many possible combinations of tractor-trucks and semi-trailers into and out of loading position at docks or in stalls and driveways. However, the maneuvering space required is largely dependent on three factors: (1) overall length of the tractor-trailer unit; (2) the width of the position in which the vehicle must be placed; and (3) the turning radius of the tractor-truck which pulls the unit. Inasmuch as a tractor-trailer uses slightly more space to pull out than to back in, all reference to maneuvering apron space is based on the requirements for pulling out.

LENGTH OF TRACTOR-TRAILER UNIT

The length of tractor-trailer units to be accommodated will vary in accordance with state laws and differing types of operation. Analysis of the specific problem will give the answer as to the largest vehicle to be considered in your planning. However, for the purposes of this discussion, tractor-trailer units of 35, 40 and 45 ft. are considered as being the most prevalent overall lengths. If an appreciable volume of traffic is handled by "for hire" motor transport, it may be expected that the unit length to be accommodated will approximate the legal limit in the state concerned, usually about 45 ft. (see Table I). It is obvious that commercial haulers will use the maximum size tractor-trailer practical for efficient operation within state limitations. In general, it may be assumed that straight trucks can be accommodated in the space required for tractor-trailer units inasmuch as it has been impractical to build trucks even approaching the length and cubic capacity of modern trailers. In some states trains of more than one trailer are permitted. Such equipment is not being considered as it is assumed that each trailer in a train would be spotted separately.

WIDTH OF POSITION

The maximum allowable width of a truck or trailer is 8 ft. and it may be assumed that virtually all units (other than those for light city delivery) are built to take full advantage of this dimension. It is the consensus of opinion among transport and traffic men interviewed that 12 ft. is a very desirable width for doors, stalls, or other positions. Slightly narrower position widths can be utilized when necessary but should be avoided in order to reduce the possibility of damage to equipment and loss of time for jockeying into position. Also, as position width increases, the apron space required for maneuvering will decrease.

TURNING RADII OF TRACTOR-TRUCKS

The turning radii of tractor-trucks have a definite bearing on the apron space required for maneuvering equipment. However, because of the variation in this dimension among trucks of different types, capacities and makes, a high average turning radius has been used in arriving at recommendations regarding space requirements (see Table II, page 152). The requirements of heavy-duty units with extremely long turning radii have been omitted from the table. If such equipment is a factor in any operation, a special study should be made to determine the space required. Units utilizing cab-over-engine truck-tractors will have somewhat shorter turning radii for the same lengths and, consequently, will require less apron space than units with conventional tractors. At the present time, it is recommended that the shorter turning radius of the cab-over-engine tractor be ignored in planning loading facilities. Many of these tractor-trucks are in use, but few shippers can count on their exclusive use.

TABLE I — STATE LENGTH LIMITS* OF TRACTOR-SEMI-TRAILER UNITS

State	Ft.	State	Ft.	State	Ft.	State	Ft.
Alabama	45	Indiana	40A–45T	Montana	60	Pennsylvania	45
Arizona	65	Iowa	45	Nebraska	42	Rhode Island	45
Arkansas	45	Kansas	45	Nevada	NR	South Carolina	50
California	60	Kentucky	45	New Hampshire	45	South Dakota	50
Colorado	60	Louisiana	50	New Jersey	45	Tennessee	45
Connecticut	45	Maine	45	New Mexico	65	Texas	45
Delaware	50	Maryland	55	New York	50	Utah	60
Dist. of Columbia	50	Massachusetts	45	North Carolina	48	Vermont	50
Florida	50	Michigan	50	North Dakota	45	Virginia	45
Georgia	45	Minnesota	45	Ohio	45	Washington	60
Idaho	45	Mississippi	45	Oklahoma	45	West Virginia	45
Illinois	45	Missouri	45	Oregon	50	Wisconsin	45
						Wyoming	50

A — Actual Law T — Temporary Allowance NR — No Restriction

* The above digest was compiled from information available as of August 1, 1947, but is subject to change. It is suggested you consult your State Trucking Association or Highway Department for more recent or prospective changes in these limitations.

APRON SPACE REQUIRED

The apron space required to maneuver tractor-trailer units into or out of loading position in one maneuver has been worked out in practical tests with standard equipment handled by experienced drivers. Inasmuch as a high average turning radius has been arbitrarily used to provide a margin for differences in equipment, the variable factors were overall length and position width. *The apron space required is measured out from the outermost part of any vehicle or other possible obstruction in the area of the maneuver.*

In the case of a single-position unobstructed dock (a), the distance would be measured straight out from the dock. However, if a canopy or roof, supported by posts (b), should be present to protect the loading area, the distance would be measured out from the posts. If it is necessary to spot a trailer alongside another vehicle (c), the distance would be measured from the outermost point of the vehicle obstructing the maneuver. When a stall or driveway is involved (d), the distance would be measured from the outermost obstruction, such as a curb, pole, or vehicle, etc. To facilitate planning, a table of dimensions (Table II) has been prepared as a guide on space requirements for the most efficient maneuvering of motor transports into and out of loading position, in *one* maneuver.

The figures in Table II do not include margin for driver-error or any provision for congestion, storage or parking of equipment. It is highly recommended that at least the minimum apron space be allowed and that it be kept clear for the approach and maneuvering of transport units.

In locations where the proper space is not available for parking in one maneuver, trailers can be jockeyed into position. This, however, is a time-wasting, costly, and unsatisfactory process for both commercial and private transport operators.

OVERHEAD CLEARANCE

Standard trailers vary in height up to 12½ ft. Consequently, it is recommended that 14-ft. clearance be provided at docks or in yards, driveways, doors, stalls and interior roadways. Special transportation conditions such as delivery of large machinery may require greater clearance.

DRAINAGE

Roofs or canopies over loading docks should be constructed so as to avoid drainage into the loading area. This precaution will reduce the hazards of mud and ice and the resulting loss of traction. It is particularly important to prevent ice formation on the pavement where tractor and trailer are coupled.

SHUTTLE OPERATION

In many instances, consideration should be given to space requirements at docks, or in yards or buildings, for parking trailers used in shuttle operation, a system utilized in many industries to take advantage of its inherent savings in equipment and labor. Basically, shuttle operation consists of handling two or more trailers with one truck and driver. While one trailer is in transit, another may be at a dock unloading, while a third is being loaded.

TRAFFIC CONGESTION

So far as possible, loading areas and approaches should be free from general traffic and obstructions. Railroad crossings, automobile traffic, parked vehicles, and material carelessly stored outside all contribute to delays in pick-up and delivery.

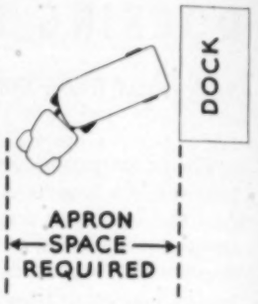
PITS AND RAMPS

When the use of loading pits and ramps is unavoidable, several factors deserve careful attention. Types of transports, and their loads, should be studied to determine the maximum practical grade which can be negotiated. It may be easy to back into a pit — but can the load be pulled out? Furthermore, such installations should be protected against ice and mud so that power will not be lost through poor traction.

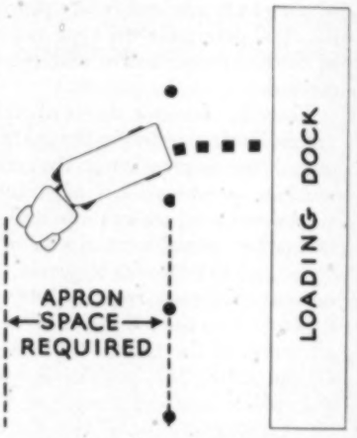
(*Continued on page 155*)

TABLE II — "APRON SPACE REQUIRED FOR ONE MANEUVER INTO OR OUT OF POSITION

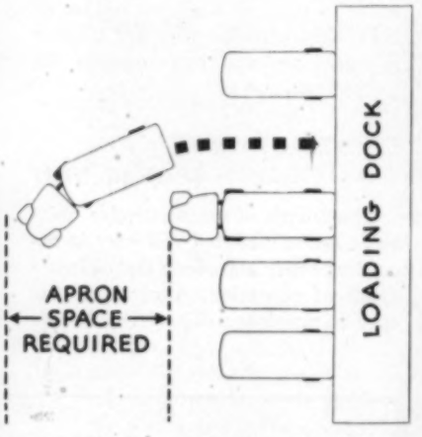
Length of Tractor-Trailer	*Width of Position*	*"Apron" Space*
35′	10′	46′
	12′	43′
	14′	39′
40′	10′	48′
	12′	44′
	14′	42′
45′	10′	57′
	12′	49′
	14′	48′



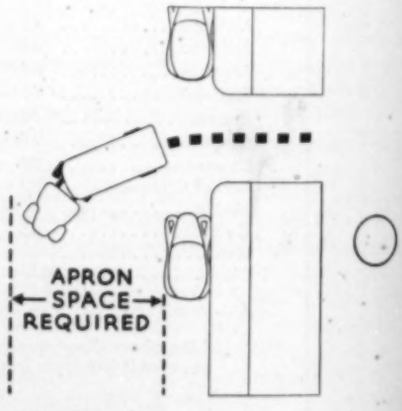
(a) Unobstructed dock



(b) Post-supported canopy



(c) Alongside other vehicles



(d) Driveways and stalls

DOCKING FACILITIES FOR MOTOR TRANSPORTS

(*Continued from page 152*)

By Fruehauf Trailer Company, Detroit

BUILT-IN TRANSPORTATION

More and more interest is being evidenced in the possibilities offered by the use of "built-in" or "run-through" facilities. In many cases, spot delivery inside the plant will facilitate handling of heavy material, or direct delivery to an assembly line or other point may eliminate costly re-handling. A straight one-way "run-through" need be only 10 ft. wide to provide minimum clearance for the 8-ft. maximum width of a transport unit. However, other traffic, unloading problems, or special considerations such as delivery of special equipment on flat-bed carry-alls might require extra width, and possibly greater overhead clearance than the 14 ft. previously mentioned. If a right angle turn must be negotiated in a narrow driveway, extra clear space should be provided on the inside of the turn to eliminate maneuvering.

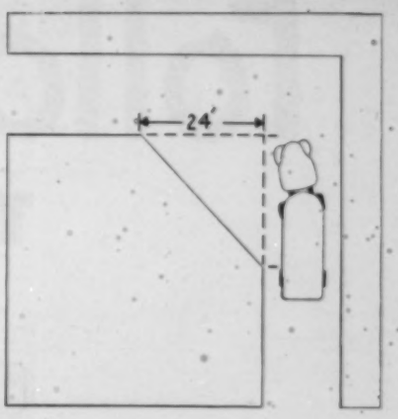
For instance, in a driveway 12 to 14 ft. wide, the triangular area, formed by the inside corner of the turn and the two points 24 ft. on each side of the corner, should be left clear. This will allow proper clearance for the turning radius of the tractor-truck and the cut-in of trailer wheels.

LOADING LEVEL

A troublesome factor in loading and unloading at docks or loading platforms is the inherent variation in loading level (distance from pavement to floor level) of motor transport equipment. This distance averages 51 in. for heavy equipment but varies within a 6-in. range depending on model, tire size, and load. Due to spring compression, a heavily loaded trailer may be 3 in. lower than when empty. Also, one model trailer may be equipped with any one of a number of tire sizes, depending on the load it is required to carry. This factor can cause a variation of as much as 3 in. in loading level. Dock heights of from 44 to 50 in. are in general use, but only an analysis of the specific operation can determine the proper answer to the loading level problem. In general, 48 to 50 in. is most satisfactory for heavy-duty units, while slightly lower docks are more convenient for lighter equipment.

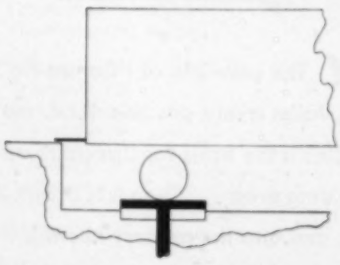
If the dock and trailer-bed levels are not equal, it is usually more satisfactory to have the dock level lower than the trailer-bed. This will permit opening and closing of trailer doors while in loading position. Except in rare cases, a slight difference in level between trailer and dock is of no great concern although a larger difference is often a handicap. Many ingenious methods have been devised to overcome such a difference and a large percentage of these have succeeded in solving the specific or general problems involved. Some of these methods are illustrated below.

Another factor to be considered is the lower bed-level of the light truck. If an appreciable part of your freight is handled by such trucks, because of short hauls, local delivery, or small loads, it may be advisable to provide docks to accommodate them.

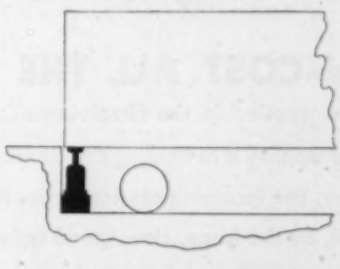


Turning clearance for inside driveway

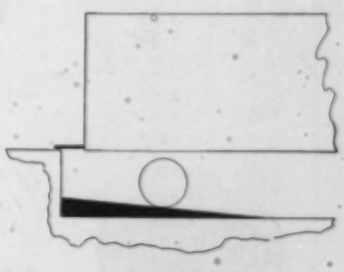
Methods used to overcome differences in loading level



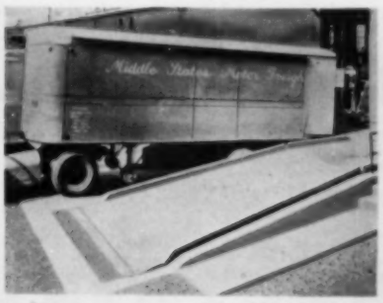
Plunger-type elevator



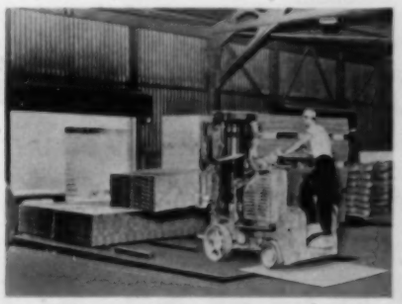
Manual or power-operated jack



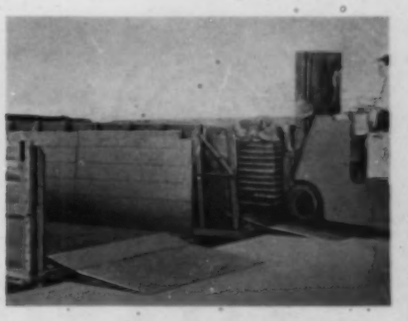
Permanent or movable incline



Adjustable loading ramp raises or lowers trailer to the desired level



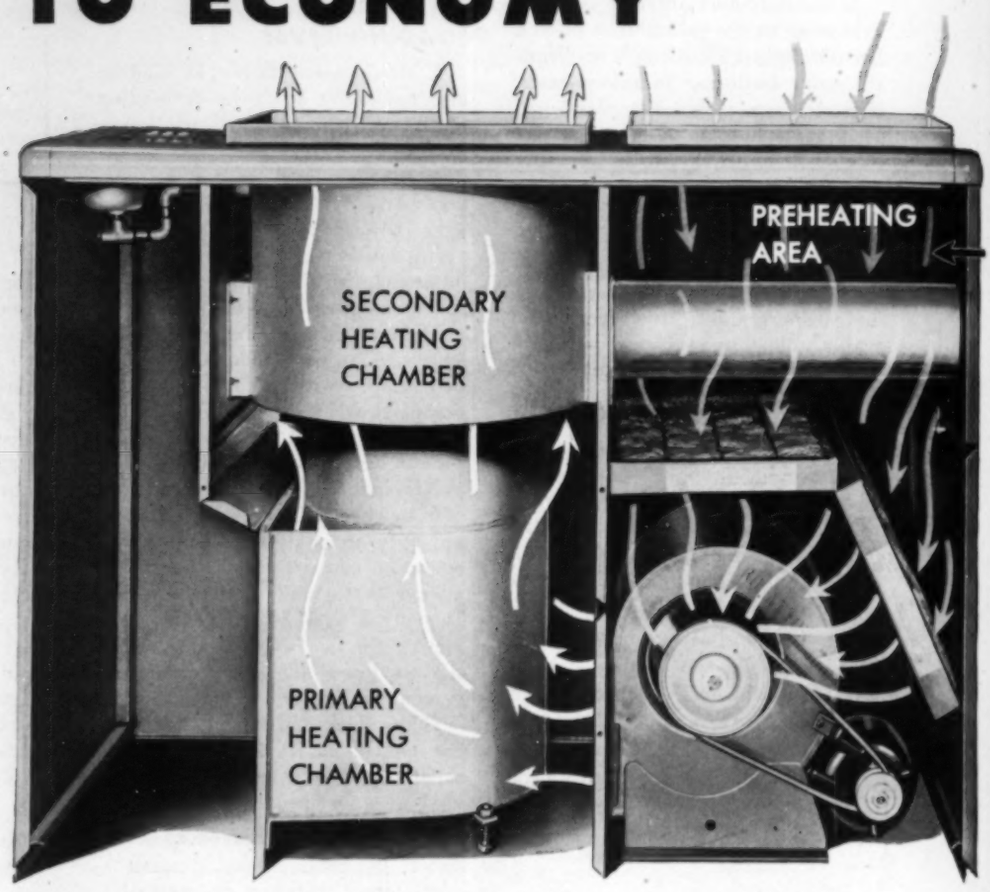
Metal plate facilitates the use of materials handling equipment



Platform adjusts for differences in level. Hinged plate bridges gap

Follow the arrows

TO ECONOMY



The Fitzgibbons Directaire works ideally with either the oil or gas burner of your choice. The attractive jacket completely encloses most burners and all controls. Jacket panels are quickly removable for easy servicing.

The Directaire is built entirely of steel, electrically welded into a gas-tight unit. The jacket assembles easily and quickly. And the oil or gas burner operates at highest efficiency, providing lowest possible operating costs.

LOW-COST ALL THE WAY The principle of "Contra-Flo" Circulation as applied in the Fitzgibbons Directaire, takes every possible B.t.u. out of the fuel and applies it to heating the circulated air. This is the basis for Directaire operating economy. The incoming air first enters the *preheating area* . . . Then it is drawn through the filter, by the large, slow-speed quiet blower, and into the *primary heating chamber* . . . Then up into and through the *secondary heating chamber, where it also receives* humidification.

Six sizes — 65,000 to 200,000 B.t.u./hr. Full data in the bulletin on request.

MEMBER
NATIONAL WARM AIR HEATING INDOOR COMFORT AND AIR CONDITIONING ASSOCIATION

MOST ECONOMICAL IN FUEL 1890 THE FITZGIBBONS BOILER
Reg. U.S. Pat. Off.

Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK 17, N. Y.

Manufactured at: OSWEGO, N. Y. *Sales Branches in Principal Cities*

FITZGIBBONS DIRECTAIRE

The warm air conditioner that meets all conditions

CRITICAL CLEARANCE DIMENSIONS OF AUTOMOBILES

Data Developed by Urban Land Institute, Washington, D. C., courtesy URBAN LAND

Recent trend in automobile design has been toward longer, wider, and lower cars which reflect the streamlining of super-highway design but not the limitations of terminal facilities. The accompanying table gives critical dimensions of most of the popular makes.

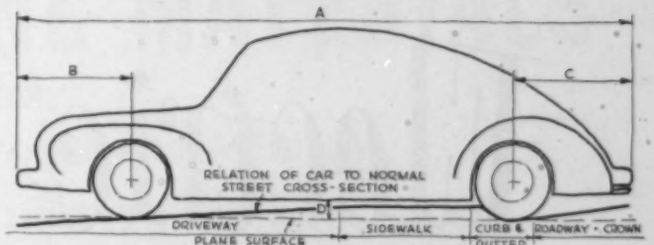


DIAGRAM OF CAR CLEARANCES

	A	B	C	D			
Name	Overall Length (Feet)	OVERHANG: Ctr. Front Wheel to Front Bumper (Feet)	OVERHANG: Ctr. Rear Wheel to Rear Bumper (Feet)	GROUND CLEARANCE: Ground to Lowest Points (Inches)	GROUND CLEARANCE: Location of Lowest Point	Turning Circle Average (Feet)	Overall Width (Feet)
1946 Chrysler —							
Crown Imperial — 8 cyl.	19.6	3.6	3.8	7.0	Muffler	48.2	6.3
Imperial — 8 cyl.	17.9	3.5	3.8	6.8	"	41.6	6.3
Royal — 6 cyl.	17.4	3.5	3.8	6.5	"	40.7	6.3
Royal — 6 cyl., 7 passenger	18.9	3.4	3.8	6.8	"	45.0	6.3
DeSoto	17.3	3.2	4.0	6.5	"	40.5	6.3
De Soto (7 passenger)	18.8	3.2	4.0	6.8	"	45.0	6.3
Dodge	17.1	3.1	4.0	6.5	"	40.2	6.3
Dodge (7 passenger)	18.6	3.1	4.0	6.8	"	45.0	6.3
Plymouth	16.4	2.8	3.8	6.5	"	39.3	6.1
1946 Buick — "40"	17.3	3.0	4.2	6.0	Transverse Bracket	42.7	6.5
Buick — "50"	17.7	3.1	4.3	5.9	"	44.2	6.6
Buick — "70"	18.1	3.0	4.3	6.1	Exhaust Pipe	45.6	6.6
Cadillac 60S	18.7	3.0	4.6	6.3	Rear Spring	48.3	6.7
Cadillac 61	17.8	2.9	4.4	6.6	"	45.7	6.7
Cadillac 62	18.3	3.0	4.6	6.4	"	52.8	6.7
Cadillac 75	18.9	2.9	4.7	5.8	"	48.8	6.9
Chevrolet — St. Master	16.6	2.8	4.1	7.3	"	42.3	6.1
Chevrolet — Flt. Master	16.6	2.8	4.1	7.4	"	42.4	6.1
Oldsmobile-66	17.0	3.0	4.1	7.2	Rear Stabilizer Bracket	41.9	6.3
Oldsmobile-76	17.7	3.0	4.4	7.1	Frame X Member	42.6	6.3
Oldsmobile-70	17.7	3.0	4.4	6.9	"	43.9	6.3
Oldsmobile-98	18.0	3.0	4.5	7.1	"	46.0	6.5
Pontiac-25	17.0	3.0	4.2	7.7	Frame Center	42.6	6.3
Pontiac-26	17.5	3.0	4.4	7.3	"	43.7	6.4
Pontiac-27	17.0	3.0	4.2	7.7	"	42.6	6.3
Pontiac-28	17.5	3.0	4.3	6.3	Splash Pan	41.7	6.4
1946 Lincoln	18.2	3.2	4.5	6.8	Center X Member	44.5	6.5
Mercury	16.9	3.0	4.0	7.5	Center of Axle Beam	41.0	6.1
Ford	16.5	3.0	4.2	7.5	Center of Axle I Beam	41.0	6.1
1947 Studebaker —							
14A — Long Commander	17.4	3.3	3.8	6.1	Muffler Bracket	42.9	5.8
14A — Commander	17.0	3.3	3.8	6.1	"	42.0	5.8
6G — Champion	16.0	2.9	3.8	5.9	Exhaust Pipe Bracket	42.9	5.8
1946 Nash —							
Ambassador 6	17.4	2.8	4.0	8.0	Exhaust Pipe (32" Back of Front Wheel)	38.0	6.3
Nash "600"	16.6	2.8	4.0	9.0	Muffler (46" Back of Front Wheel)	41.0	6.3
1946 Packard — 2100-1-11	17.4	3.2	4.2	6.7	Muffler	42.0	6.3
2103-6	18.0	3.2	4.2	6.9	"	44.0	6.3
2126	19.7	3.2	4.2	.....	.....	52.0	6.3
1947 — Kaiser and Frazer	16.9	2.8	3.8	7.1	Rear Axle	44.0	6.1

From data furnished by the Chrysler, General Motors, Ford, Nash, Studebaker, Packard, and Kaiser-Frazer Corporations.

FOR THE 1st Time IN AN Electric Stairway...

HERE IT IS! The new single-file Westinghouse Electric Stairway for the smaller store . . . with deluxe features and construction . . . at a price you can afford to pay!

Carrying 4000 people an hour at 90 feet a minute, this new electric stairway has two-step leveling at top and bottom, two brakes, trip-proof combplates, reinforced skirtguards, extended handrails at top and bottom . . . all for maximum safety and convenience. Etched and anodized aluminum balustrades give it a beauty that harmonizes with and enhances the eye-appeal of any store interior.

Standard Westinghouse engineering and construction assure dependable, quiet operation . . . and maintenance economy. Because of its standardized design, it can be installed quickly with a minimum interruption in your normal store operation.

Only a limited number will be available for 1948 delivery. Investigate now! For complete information, write to the Westinghouse Electric Corporation, Elevator Division, 150 Pacific Avenue, Jersey City 4, N. J. on your letterhead please.

★ *Engineering information available to architects*

Westinghouse

ELEVATOR DIVISION

J-98508

20% PRICE REDUCTION IN BUILDING MATERIALS

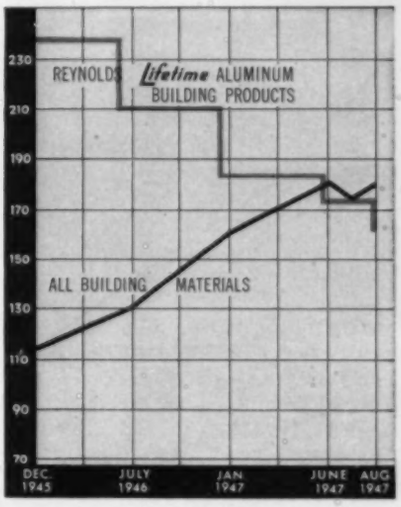
. . . REYNOLDS *Lifetime* ALUMINUM CLAPBOARD SIDING, SHINGLES, "SNAP-SEAL" AND CEILING PANELS REDUCED

Increasing demand supports more efficient Manufacturing Facilities—brings prices below competitive average

The one obstacle that has kept some builders and architects from turning to long-lasting, low-maintenance, readily available aluminum has been price. *That obstacle is now removed.* Starting with aluminum itself at a base price 30% below pre-war, Reynolds mass fabrication has made possible successive price reductions that bring these aluminum building materials below the Bureau of Labor Statistics overall average!

Important Advantages Available at No More or Even Less Cost

That means the home-owner or plant operator need pay no premium for building material that is fire-proof, rust-proof, defies rot and termites, lasts indefinitely. In fact, with aluminum's easy application and because it needs no painting the installed cost may come to considerably *less* than comparable materials. The buyer gets



a free bonus of highly effective insulation, too . . . because aluminum reflects up to 95% of all radiant heat.

Byrne Organization and N.K.Winston among Big Builders Using Reynolds Lifetime Aluminum

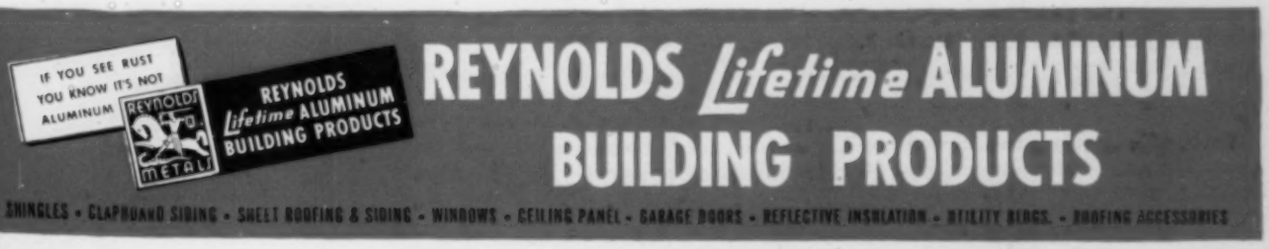
In Byrne's big Harundale (Md.) development of 1100 site-fabricated homes, Reynolds Lifetime Aluminum Clapboard Siding is now being used consistently. This siding lends itself particularly to shop assembly of entire wall sections. Reynolds Lifetime Aluminum Shingles have likewise been applied on entire shop-built roofs of Harundale houses.

N. K. Winston, President of Westchester's 2100-acre Continental Village, New York, is also adopting Reynolds Lifetime Aluminum.

Industrial and Farm as well as Home Use Increasing

The advantages of Reynolds Sheet Roofing and Siding—Corrugated, 5-V Crimp, "Snap-Seal" and Weatherboard—have long been recognized in industrial and farm construction. But the 8" Clapboard Siding has also been increasingly successful in these fields. And now, with this present price reduction, many a plant designer and farmer can afford this finer residential type of siding on his walls.

The sales trend is to aluminum...get in with the trend. See Sweets or write for detailed A.I.A. brochure on Reynolds Lifetime Aluminum Building Products. Reynolds Metals Company, Building Products Division, Louisville 1, Ky.


IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM
REYNOLDS METALS
REYNOLDS Lifetime ALUMINUM BUILDING PRODUCTS
REYNOLDS Lifetime ALUMINUM BUILDING PRODUCTS
SHINGLES • CLAPBOARD SIDING • SHEET ROOFING & SIDING • WINDOWS • CEILING PANEL • GARAGE DOORS • REFLECTIVE INSULATION • UTILITY BLDGS. • ROOFING ACCESSORIES

MANUFACTURERS' LITERATURE

AIR CONDITIONING

AAF Replaceable Type Air Filters: Selective Air Filtration* (Bulletin 210). Description of new types of replaceable air filters for ventilating and air-conditioning systems, along with instructions for maintenance and detailed engineering and installation data. 8 pp., illus. American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.*

McQuay Year 'Round Air Conditioners (Bulletin 83A). Folder listing construction features of air conditioner with ripple-fin aluminum cooling and heating coils, available in 2-, 3-, 5-, and 7½-ton models; tables giving coil selection, steam heating coil conversion factors, motor and drive selection; also specifications and dimensional data. 4 pp., illus. McQuay, Inc., 1600 Broadway N.E., Minneapolis, Minn.

CONCRETE MASONRY

Besser Modular Standard Building Units. Booklet by the manufacturer of block plant equipment, illustrating concrete building units having modular dimensions: bull nose units, beam lintel block, chimney block, floor filler units, etc., in addition to the standard units of block and tile. 24 pp., illus. Besser Manufacturing Co., Alpena, Mich. *$2.00.*

DESIGN

Private Boat-Houses and Docks. Booklet containing plans and details for 21 different types of shelters for small boats, designed by architects Leonard Wayman and Ray Stuermer, based on the findings of a national survey of existing waterside facilities and needs. Included are complete materials lists. 12 pp., illus. Outboard Boating Club of America, 307 N. Michigan Ave., Chicago 1, Ill. *35 cents.*

Symposium of Fire Station Design. First of a series of booklets giving floor plans, perspective drawings, and ideas submitted by architects, fire chiefs, and technical writers associated with the fire service. Plans include bungalow stations, central headquarters, and municipal buildings with fire and police headquarters. 22 pp., illus. The Circul-Air Corp., 575 East Milwaukee Ave., Detroit 2, Mich.

ELECTRONICS

Electronic Equipment. Sound-system equipment for churches and schools: carillonic bells unit, tower music systems, voice and music distribution systems, acoustic correction units, and pew hearing aids; church plans showing typical placement of electronic units. 8 pp., illus. Schulmerich Electronics, Inc., Sellersville, Penn.*

FLOORING

Emeri-Crete Flooring (Bulletin 601). Pamphlet describing characteristics of concrete made with Cortland emery aggregate to provide permanent, non-skid, non-absorbent flooring for industrial use; tables showing comparative results of compressive and tension break tests. 8 pp., illus. Walter Maguire Co., Inc., 330 West 42nd St., New York.

HEATING

Radiant Panel Heating: A Non-Technical Discussion. Booklet intended primarily for architects, engineers, and heating contractors, who seek sufficient background to compare radiant panel heating with other types of heating systems. Discusses advantages and disadvantages, both claimed and assured, of panel heating; relative advantages of ceiling, wall, and floor panels; best methods of distributing the panel surface. 36 pp., illus. Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N. Y.*

Type C Worm-Feed Stokers (Bulletin S-70, Second Edition). Booklet describing features of a new stoker in the Brownell line of boiler room equipment: three speeds, safety cut-out, automatic air volume control, and gas-repellent valve for preventing blow-back; available in 11 standard sizes with coal-burning capacities ranging from 177 to 1000 lb. per hour. 8 pp., illus. The Brownell Co., Dayton 1, Ohio.

Webster System Radiation. Description of concealed lightweight units for steam convection heating: types of enclosures, features of mechanical construction, how to select correct sizes, architectural specifications, design and installation data, heating elements, and rated capacities. 16 pp., illus. Warren Webster & Co., Camden, N. J.*

INDUSTRIAL FINISHING

Planned Systems for Complete Paint Finishing. Technical bulletin outlining basic points to be considered in planning complete organic finishing systems for industrial plants: parts washers, spray booths, ovens, and air-processing equipment. 12 pp., illus. Peters-Dalton, Inc., 17908 Ryan Rd., Detroit 12, Mich.

METAL TRIM

Chromedge Metal Trims: Builder's Guide for All Wallboard Materials. Catalog of extruded aluminum alloy and stainless steel trims and accessories: divider bars, cap molds, bathtub coves, outside and inside corners, nosings, linoleum-insert trims, sink-well frames. 18 pp., illus. The B & T Metals Co., Columbus 16, Ohio.*

MONOLITHIC CONSTRUCTION

On-the-Site Monolithic Construction. Information about the Tournalayer system of mass-producing houses by casting in huge forms entire building units consisting of walls, roof, ceiling, and center partition; transporting to the site; basic building units. 8 pp., illus. Tournalayer Sales Div., R. G. LeTourneau, Inc., Longview, Tex.

PAINT

Vita-Var Vita-Lux Enamel: The Whiter Enamel for Industrial Interiors. Folder describing a white enamel for use on walls, ceilings and woodwork. Describes uses and features, methods of application. 6 pp., illus. Vita-Var Corp., Newark, N. J.*

PIPE

Transite House Connection Pipe. Booklet giving specifications of Transite pipe and fittings made from a mixture of asbestos fibers and cement, for house sewage disposal lines; typical installation layouts, and illustrated step-by-step installation data. Johns-Manville, 22 East 40th St., New York 16, N. Y.*

PLASTICS

(1) Corrugated and Patterned Plexiglas; (2) Plexiglas for Signs; (3) Plexiglas for Merchandising Aids; (4) Plexiglas for Hospital Equipment. Series of booklets describing the new corrugated and patterned Plexiglas; and uses of the standard material for signs, show cases, and visual wall units, and for various items of hospital equipment. 4, 16, 18, and 4 pp., all illus. Rohm & Haas Co., Philadelphia, Penn.

PORCELAIN ENAMEL

How Architectural Porcelain Enamel Produces Profits. Brochure discussing architectural applications of porcelain enamel in remodeling and standardized new construction of stores, gasoline stations, restaurants, theaters, etc. 16 pp., illus. Porcelain Enamel Institute, 1010 Vermont Ave., N. W., Washington 5, D. C.*

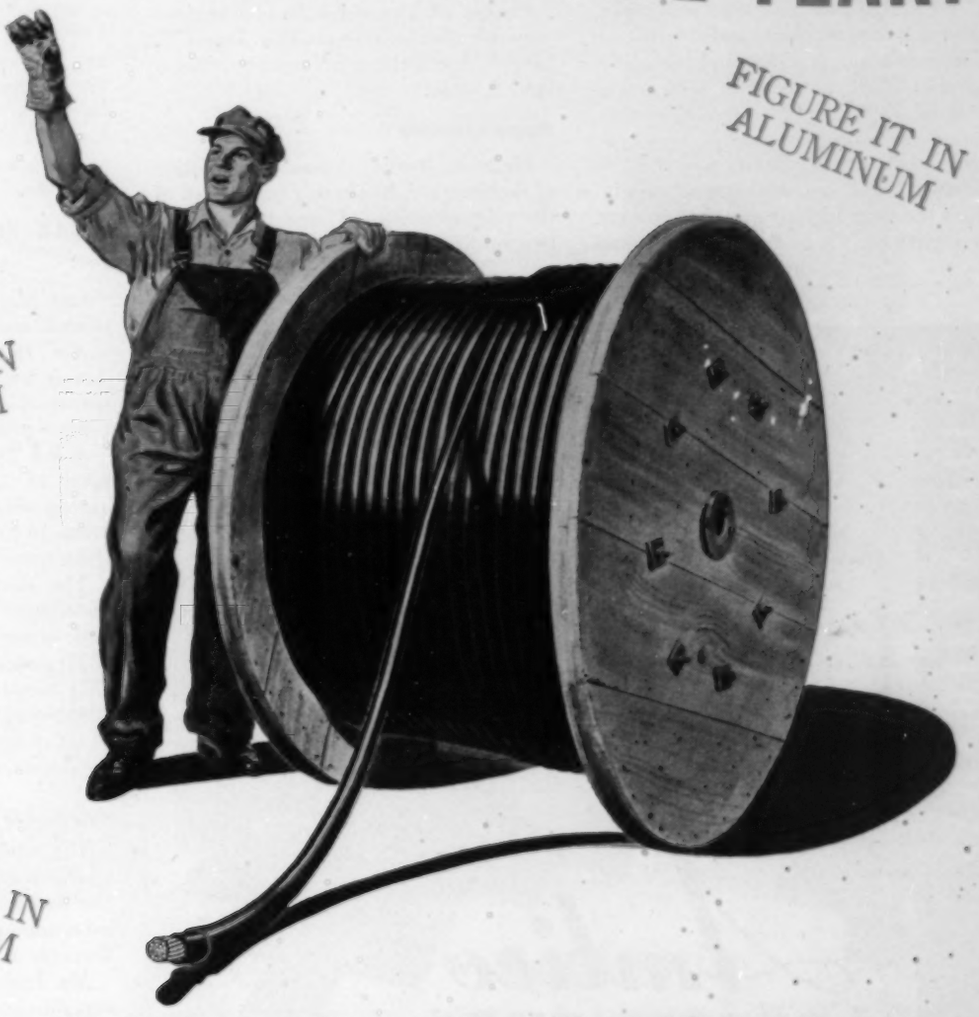
TIMBER CONNECTORS

Installing Teco Timber Connectors in Light and Heavy Timber Structures. Booklet illustrating and describ-

(Continued on page 186)

* Other product information in Sweet's File, 1947.

IT'S THE ELECTRICAL NEWS OF THE YEAR!



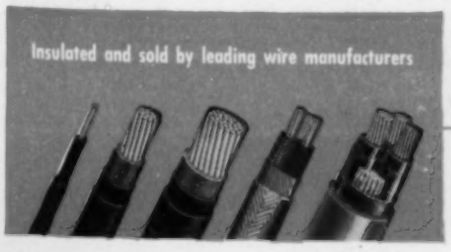
ALUMINUM CUTS WIRING COSTS!

Every construction or modernization job now on the boards calls for electric wire and cable. This new "buy-word" in wire and cable brings good news to architects and their engineers—*figure it in aluminum*, for lower over-all job costs.

Figure it in aluminum—to save money. *Figure it in aluminum* because it gives you everything you want in a conductor. Wire and cable manufacturers are already calling it "the conductor of the present and future". *Figure it in aluminum* because wholesalers are selling this wire with confidence; contractors are installing it with assurance of dependability.

To make available the light, dependable, conductive E. C.* Aluminum for this service is Alcoa's job. Wire and cable manufacturers make the finished product, selling it under their trademarks through established wholesalers. It will pay dividends, now and in the future, to *figure it in aluminum*. ALUMINUM COMPANY OF AMERICA, 1441 Gulf Building, Pittsburgh 19, Pa. Sales offices in principal cities.

* E.C.: Electrical Conductor Aluminum



ALCOA EC ALUMINUM

FOR ELECTRIC WIRE AND CABLE

students of various engineering schools and colleges will submit papers on arc welded design and the use of welding in maintenance of machines and structures; 77 awards totaling $5000 and including a first of $1000, a second of $500 and a third of $250, will be offered in this section of the program. Under the scholarship plan, seven scholarships of $250 each will be allocated to the schools in which the three highest award recipients are registered, the institutions receiving in each case scholarships equaling in value the award concerned.

Copies of the rules and conditions may be obtained from The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio.

Appointments

Herbert Reeves Sinnard, professor of architecture, has been named head of the department of architecture at Oregon State College.

AMERICAN TILE & RUBBER CO.
TRENTON, N. J.

Amtico
RUBBER TILE for
Long Lasting, Quiet, Beauty

The Architects' Choice—

Because of the unlimited possibilities for distinctive color combination—both color and arrangements of pattern are flexible.

Because it is durable and its color will not fade or wear off or be destroyed by cigarette marks.

Because it is resilient—so pleasant underfoot, its natural resiliency cushions each step and tones down surface noise.

Because it is easy to keep immaculately clean.

Because it is made in many beautiful, marbleized colors.

Because it is available for immediate shipment.

Manufacturers of "AMTICO" RUBBER TILE FLOORING—Marble & Terrazzo Effects, "TRENT" RUBBER FLOORING—By the Roll, Plain and Marbleized Colors RUBBER MATS & MATTING—Plain & Designed Effects. RUBBER STAIR TREADS AND NOSINGS

George G. Thorp, assistant director of the American Federation of Art, has been appointed dean of the Art School of the Akron Art Institute.

Lawrence Albert Enersen, formerly a member of the teaching staff of the University of Michigan and the Graduate School of Design, Harvard University, has been appointed professor of landscape architecture at the North Carolina State College of Agriculture and Engineering, University of North Carolina.

DISABLED VETERANS IN CONSTRUCTION

One of every 17 disabled veterans in schools and on-the-job training courses under the Vocational Rehabilitation Act is learning a skill or trade in the construction field, the Veterans Administration reports.

A VA 79-per cent sampling showed a total of 13,400 construction trainees among some 229,000 handicapped veterans in training on May 1. Most of them were taking on-the-job training.

The disabled veteran-trainees were distributed in the following fields: brick and stone masons, 646; carpenters, 3371; miscellaneous construction trades, 257; electricians, 4017; painters, construction, 890; plasterers, 144; plumbers, 2143; tinsmiths, 1459; welders and flame cutters, 473.

INGBERG RETIRES

The retirement of Simon H. Ingberg, Chief of the Fire Resistance Section of the National Bureau of Standards, has been announced by Dr. E. U. Condon, Director of the Bureau.

Mr. Ingberg is widely known for the experimental techniques he has introduced in the field of fire resistance, particularly for his fire severity research and investigations into the fire resistive properties of building materials and constructions.

OFFICE NOTES

Offices Opened, Reopened

Carl Frederik Brauer, A.I.A., has announced the opening of his office for the general practice of architecture at 165 E. 72nd St., New York City.

Albert Criz, A.I.A., announces the formation of an independent office for the practice of architecture at 556 S. Harvard Blvd., Los Angeles 5, Calif.

Glen M. Drew, Architect, has opened offices at 505 Vine St., Room 105, Poplar Bluff, Mo.

Vernon D. Lamp, Architect, has opened offices at 203½ Alcazar Ave., Coral Gables, Fla.

Callix E. Miller, A.I.A., has announced his separation from active duty in the U. S. Navy, Civil Engineering

(*Continued on page 168*)

. . . the new Benjamin

LUMINOUS LOUVER CEILING SYSTEM

SKY-GLO is the answer to the Lighting Plan that calls for *Inconspicuous Lighting* with low brightness . . . *More Beauty* with greater seeing comfort! Designed expressly for offices, stores, show windows and other commercial locations, the new Benjamin development features . . .

NEW LUMINOUS VINYLITE LOUVERS

This new system of translucent louvers does more than reflect light . . . it actually glows with light to form a luminous ceiling of unique beauty and atmosphere. This new Benjamin Sky-Glo System is the latest development in "louverall" lighting. With this system it becomes practical to provide . . .

100 TO 175 FOOTCANDLES

of uniform, diffused and comfortable lighting. Crosswise and lengthwise shielding of 45° eliminates glare and uncomfortable brightness. The Sky-Glo System conceals pipes, ducts and fixtures and substitutes at reasonable cost a . . .

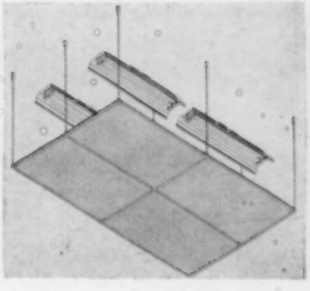
MODERN STREAMLINED CEILING

of low brightness with pleasing architectural and decorative patterns.

Write now for complete data on this new Benjamin development. These will be sent you in November.

BENJAMIN ELECTRIC MFG. CO.
DEPT. Q-1, DES PLAINES 12, ILLINOIS

STANDARDIZED STOCK SECTIONS OF LOUVERS, CHANNELS and FITTINGS simplify the layout and installation of the new Benjamin Sky-Glo System. The four sizes of louver sections and the various channel lengths make possible geometric arrangements which provide wide flexibility of design for various ceilings. Louvers are made of Vinylite, a product of The Bakelite Corporation, which has a light transmission factor of approximately 60%. These sections are easily removed for lamp and fixture maintenance and for easy cleaning.



BENJAMIN
TRADE MARK
Lighting Equipment
Distributed Exclusively through Electrical Wholesalers

Corps, and the reopening of his office for the general practice of architecture and structural engineering at 234 Christman Bldg., Main St. at Colfax Ave., South Bend 7, Ind.

E. G. Roberts, until recently chief engineer with W. C. Grant Co., Inc., Manufacturers, Contractors, Engineers, in charge of design and development work, has opened offices at 157 N. Illinois, Room 215, Indianapolis, Ind. He and his associates will offer layout work and related services in structural engineering, heating plants, mechanical equipment, distribution systems, etc.

James Berkeley Robinson, Architect, has opened an office for general practice at 21 W. Frederick St., P.O. Box 234, Staunton, Va.

New Addresses

The following new addresses have been announced:

Committee on the Hygiene of Housing, American Public Health Assn., 321 Congress Ave., New Haven 11, Conn.

Craig & Madill, Architects (J. H. Craig, F.R.A.I.C., and H. H. Madill, O.B.E., F.R.A.I.C., Hon. A.I.A.), 20 St. Clair Ave. W., Toronto 5, Canada.

Ferrenz & Taylor, Architects, 152 W. 42nd St., New York 18, N.Y.

Jackson and Callender, Architects (Huson Jackson and John Hancock Callender), 124 Washington Pl., New York 14, N.Y.

William H. MacKay, Architect, 30 Colony St., Meriden, Conn.

Charles F. Maltby, Architect, Kirby Bldg., 246 N. Main St., Herkimer, N. Y.

Douglas Dacre Stone and Lou B. Mulloy, Architects, 619 California St., San Francisco 8, Calif.

Frank Wynkoop, A.I.A., 1638 Market St., San Francisco 2, Calif.

Alexander Zamshnick, Architect, formerly associated with Noah N. Sherman, 6 E. 46th St., New York 17, N.Y.

Firm Changes

The recently formed architectural and engineering firm of Naess and Murphy will carry on all current work of Shaw, Naess and Murphy, whose dissolution as of Sept. 20 has been announced by Sigurd E. Naess and Charles F. Murphy. The firm's address remains the same: Railway Exchange Bldg., Chicago, Ill.

The firm of Hubert & Gjelsteen has been dissolved, Harry W. Gjelsteen has announced. Mr. Gjelsteen has opened his own architectural office at 230 Sheridan Rd., Menominee, Mich.

APPOINTMENTS, ELECTIONS

Earl S. Anderson, for 10 years a construction industry executive of the Los Angeles Chamber of Commerce, has been appointed general manager of the Construction Industries Exposition and Home Show of Southern California.

E. A. Buxton has been elected chairman of the Committee on Steel Pipe Research of the American Iron and Steel Institute.

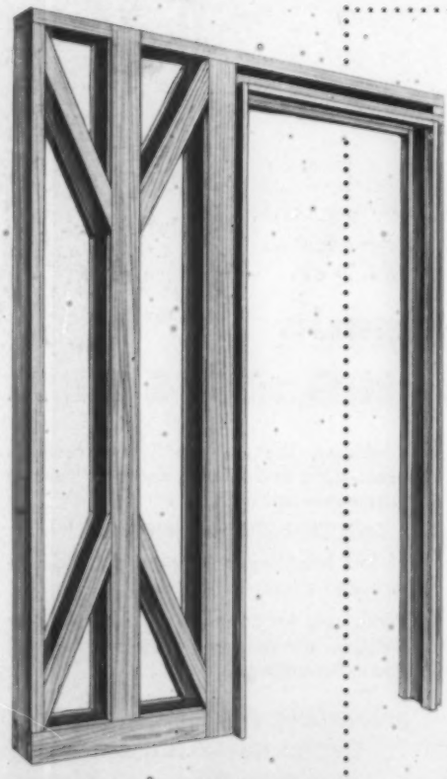
Gilmore D. Clarke, landscape architect of New York City, has been appointed the National Institute of Arts and Letters representative on the National Commission of UNESCO.

John Fies, long active in building code work in the Southwest, has been retained by the National Lumber Manufacturers Assn. to represent its Technical Department on the Pacific Coast.

ERRATUM

In the Roof Construction Analysis table for industrial buildings on page 106 of the August ARCHITECTURAL RECORD the price of Flexcore concrete plank (item 12) was incorrectly given as 28 cents a sq. ft. The correct price of the material is 58 cents.

Richards-Wilcox No. 719 Vanishing House Door Hanger and wood lined track installation in ordinary 2 x 4 studded house partition, showing application of hanger and track to header and door.



(Above) Mill construction of R-W designed "Ordinary Wall" pocket for installing vanishing house doors operating on R-W No. 719 house door hangers in ordinary 2 x 4 studded partition. This construction, developed by Richards-Wilcox engineering department, solves the problem of builders and architects who desire to get the advantages of "Richards-Wilcox" Vanishing House Doors without increasing the width of the ordinary 2 x 4 studded partitions.

with R-W Residential Vanishing Door Hangers

For doors 7/8" thick and up!

Present-day home building costs require maximum use of *all* available floor space. That is why Richards-Wilcox Vanishing (sliding) House Doors are now more popular than ever. Floor space "wasted" due to the swinging arc of hinged doors can be fully utilized with vanishing doors . . . furniture, pictures, lighting fixtures can be located conveniently and correctly.

Designed for use in 2" x 4" Studded Walls!

And with R-W Vanishing House Doors there is no extra construction cost! The R-W "Ordinary Wall" pocket permits installation of vanishing doors in standard 2" x 4" studded partitions. Get complete details from your nearest Richards-Wilcox office—free consultation available without obligation.

1880 RICHARDS WILCOX R-W MFG. CO. 1947

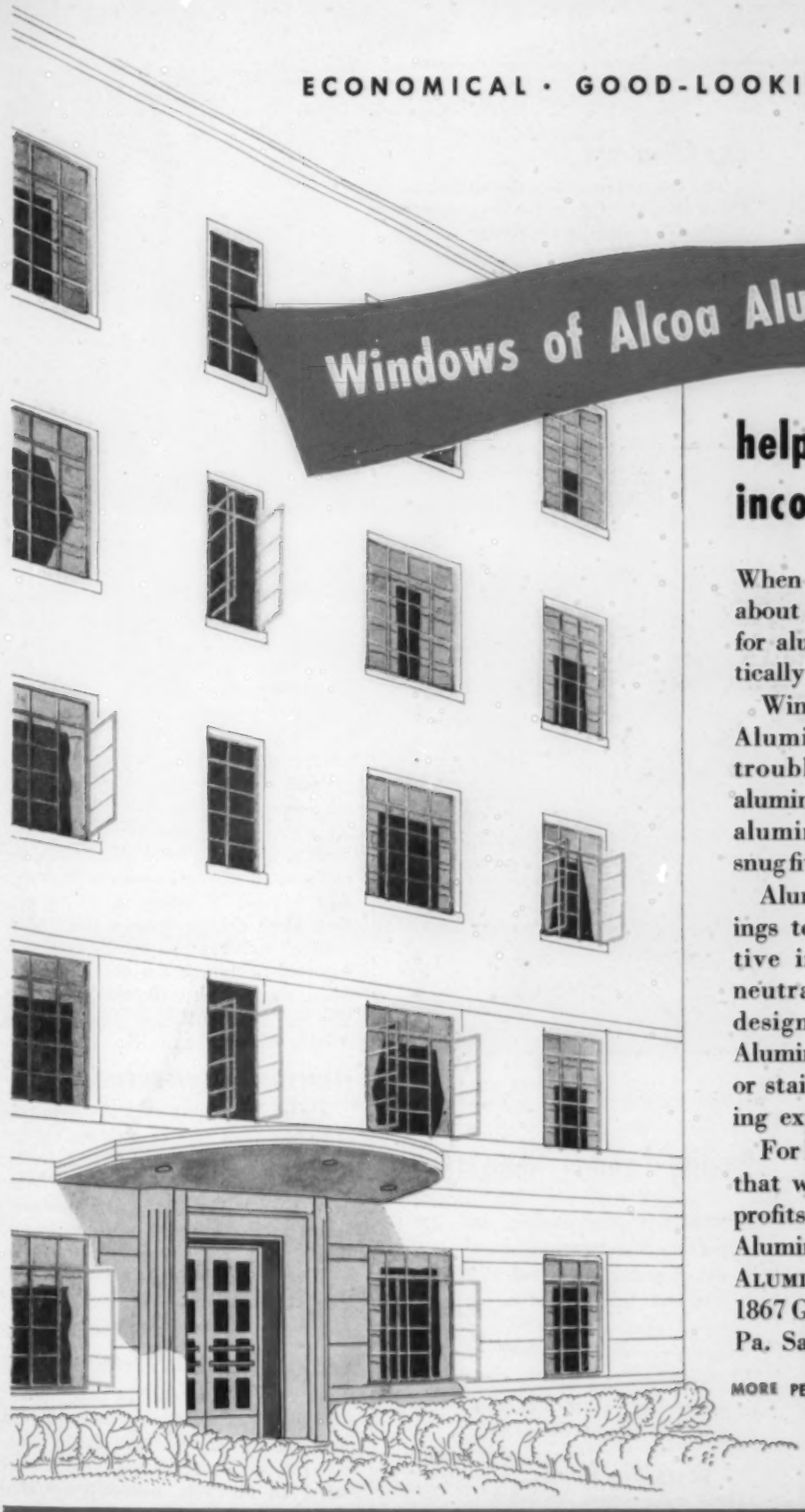
OVER 67 YEARS

Richards-Wilcox Mfg. Co.

"A HANGER FOR ANY DOOR THAT SLIDES"

AURORA, ILLINOIS, U.S.A.

ECONOMICAL · GOOD-LOOKING · TROUBLE-FREE



Windows of Alcoa Aluminum

help turn rental income into profits!

When your client asks, "How about upkeep costs?" the answer for aluminum windows is, "Practically nothing."

Windows of long-lasting Alcoa Aluminum will give years of trouble-free service. Because aluminum can't shrink or swell, aluminum windows keep their snug fit; stay easy to open and close.

Aluminum windows help buildings to stay modern and attractive in appearance. The soft, neutral color blends with all designs and materials. Alcoa Aluminum can never rust, streak, or stain adjoining surface. Painting expense is eliminated.

For housing or commercial units that will turn rental income into profits, include windows of Alcoa Aluminum. For information, write ALUMINUM COMPANY OF AMERICA, 1867 Gulf Building, Pittsburgh 19, Pa. Sales offices in leading cities.

MORE PEOPLE WANT
MORE ALUMINUM FOR
MORE USES THAN EVER

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 150*)

PLASTIC FLOOR COVERING

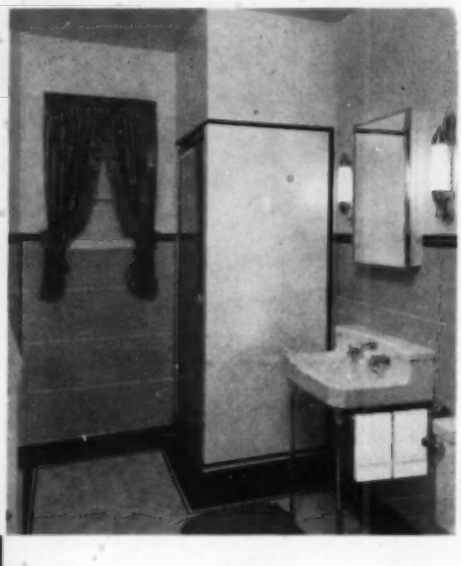
Vinylite plastics are now being used for floor covering under the name *Flor-Ever*, said to offer the following advantages: flexibility, resistance to wear, a high degree of chemical inertness, ease of cleaning without need for waxing. It is manufactured in marbleized and plain colors that extend through the material. Backing is of waterproof felt. Delaware Floor Products, Inc., Wilmington, Del.

DRAWING SET

The new *Bruning drawing set* features the following: (1) a ruling pen with adjustable collet for regulating the nib and recording the setting for future use; (2) a drafting pencil that can be converted to a double point pencil; (3) a 6-in giant bow compass that advances the lead automatically for sharpening; and a beam compass with 8-in. and 13-in. beams. Charles Bruning Co., Inc., 4754–18 Montrose Ave., Chicago 41, Ill.

Weisway Cabinet Showers harmonize with modern building materials for beauty and durability.

WEISWAY IS THE WISE WAY



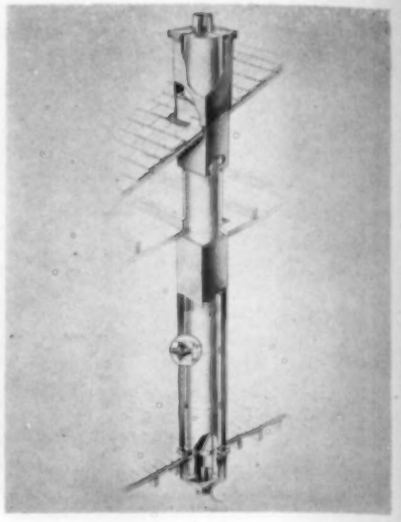
Built-in installation of corner entrance model made possible by Weisway In-A-Wall adapter.

Quality Cabinet Showers

Weisway Cabinet Showers are precision-built, to pre-war standards of quality, of materials that have been service-tested for 11 years. Guaranteed leakproof, they assure permanent satisfaction. *Weisway quality protects your reputation*—assures satisfied clients. Write for detailed information.

HENRY WEIS MFG. CO., INC.
1003 Weisway Bldg., Elkhart, Ind.

Weisway



Precast chimney requires no foundation

SECTIONAL CHIMNEY

A precast chimney, designed for one and two story houses, is shipped in sections ready for installation. It is made with a 7-in. diam. tile lining with a 3-in. wall of lightweight insulating cement, steel reinforced. Installation steps are to (1) cut holes in floor, ceiling, and roof; (2) nail chimney support in place and set first section with joint cement; (3) set second joint and lock with brass clamps, repeating until all sections are in place; (4) set roof housing in place and flash to roof; (5) fasten cap on top section. Each chimney carries the Underwriters' Laboratories label. Tests are reported to show it has the safety of a 24-in. thick brick wall chimney with a tile lining. Van-Packer Co., 120 W. Adams St., Chicago 3, Ill.

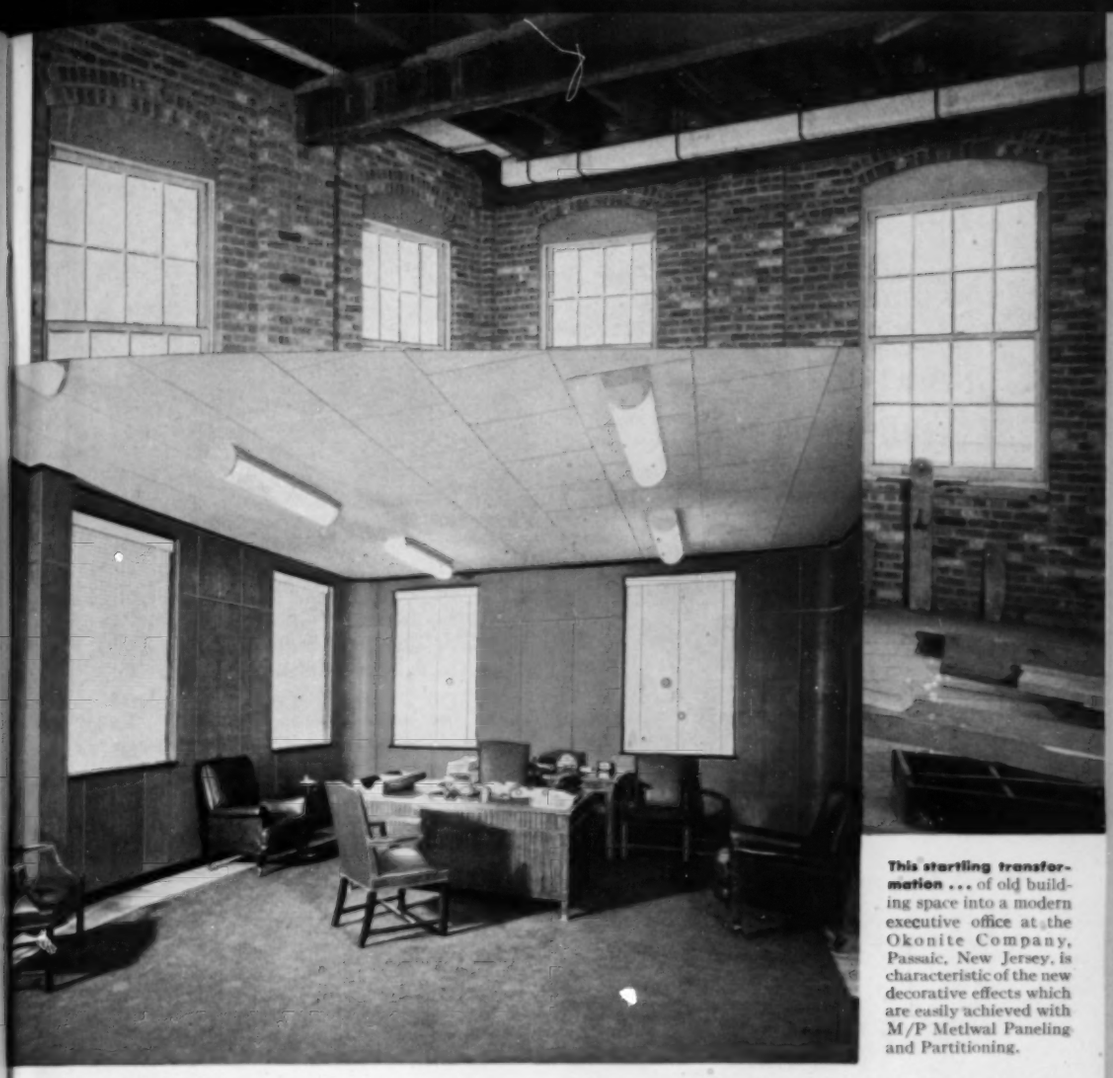
LIGHTING CONFERENCE

About 50 architects and consulting engineers took part in a recent conference at the General Electric Lighting Institute, Nela Park, Cleveland. Course of study included lighting fundamentals; lamps and operating necessities; store, home, and office lighting; available visual education facilities; design and selection of luminaires; germicidal lamps; and the economics of lighting systems.

ESCALATOR SHUTTERS

As a safety device in the event of fire, Otis Elevator Company has designed aluminum rolling shutters for its escalators in the Newark-Kresge department store. In the past, manually-operated shutters, opened and closed by cranking, have been built into some escalators, but the new shutters are motor-driven and actuated by thermostats and electric eyes. There will also be push-button controls and, in the event of power failure, the shutters can be closed by cranking. Otis Elevator Co., 260 11th Ave., New York, N. Y.

(*Continued on page 174*)



This startling transformation ... of old building space into a modern executive office at the Okonite Company, Passaic, New Jersey, is characteristic of the new decorative effects which are easily achieved with M/P Metlwal Paneling and Partitioning.

See this 10-minute demonstration. Learn how this modern method of paneling and partitioning fits your building, modernizing or partitioning plans. CALL YOUR NEAREST M/P DISTRIBUTOR TODAY.

YOUR M/P DISTRIBUTOR

ALABAMA
Birmingham — Acousti Engineering Co.
Mobile — Acoustics & Specialties Co.

ARKANSAS
Little Rock — Acoustics & Specialties Co.

CALIFORNIA
Los Angeles — The Harold E. Shugart Co.
Oakland, Sacramento, San Francisco — F. K. Pinney, Inc.

COLORADO
Denver — Lauren Burt, Inc.

CONNECTICUT
Hartford — The C. A. Bader Co.

DELAWARE
Wilmington — John H. Hampshire, Inc.
Wilmington (Eastern Shore) — The W. M. Meyer Co.

DISTRICT OF COLUMBIA
Washington — John H. Hampshire, Inc.

FLORIDA
Jacksonville, Miami — Acousti Engineering Co. of Fla.
Pensacola — Acoustics & Specialties Co.

GEORGIA
Atlanta — Acousti Engineering Co.

ILLINOIS
Decatur — Hugh J. Baker & Co.

INDIANA
Evansville, Ft. Wayne, Indianapolis, Wabash — Hugh J. Baker & Co.

KENTUCKY
Louisville — E. C. Decker & Co.

LOUISIANA
New Orleans — Acoustics & Specialties Co.

MAINE
Portland — Pitcher & Co.

MARYLAND
Baltimore — John H. Hampshire, Inc.

MASSACHUSETTS
Boston — Pitcher & Co.
Springfield — The C. A. Bader Co., Inc.

MICHIGAN
Detroit — R. E. Legnette Co.
Grand Rapids — Legnette-Michaels Co.

MINNESOTA
Minneapolis — Insulation Sales Co., Inc.

MISSOURI
Kansas City, St. Louis — Henges Co., Inc.

NEW JERSEY
Elizabeth — Jacobsen & Co.
Trenton — The W. M. Meyer Co.

NEW MEXICO
Albuquerque — The Jay Grear Corp.

NEW YORK
Albany, Buffalo, Jamestown, Rochester, Syracuse — Callum Acoustical Co.
New York City — Jacobsen & Co.

NORTH CAROLINA
Charlotte — Acousti Engineering Co. of the Carolinas

OHIO
Akron, Cleveland, Columbus, Toledo — Mid-West Acoustical & Supply Co.
Cincinnati, Dayton — E. C. Decker & Co.

PENNSYLVANIA
Altoona, Pittsburgh, Sharon — Harry C. Leezer Co.
Harrisburg, Philadelphia, Scranton — The W. M. Meyer Co.

RHODE ISLAND
Providence — Pitcher & Co.

SOUTH CAROLINA
Charleston — Acoustic Engineering Co. of the Carolinas

SOUTH DAKOTA
Sioux Falls — Insulation Sales Co., Inc.

TENNESSEE
Chattanooga, Knoxville, Nashville — Lon Herndon Co.
Memphis — Acoustics & Specialties Co.

TEXAS
Dallas, Houston, San Antonio — S. W. Nichols Co.
El Paso — The Jay Grear Corp.

UTAH
Salt Lake City — Lauren Burt, Inc.

VIRGINIA
Norfolk, Richmond, Roanoke — John H. Hampshire, Inc.

WEST VIRGINIA
Huntington — E. C. Decker & Co.
Clarksburg, Wheeling — Harry C. Leezer Co.

WISCONSIN
Milwaukee — Edw. T. VerHalen, Inc.

WYOMING
Cheyenne — Lauren Burt Inc.

Looking for a FASTER, EASIER way to get

Distinctive, Permanent Paneling?

ORDINARY buildings and rooms are quickly transformed into smart, distinctive offices by Martin-Parry Metlwals. Using *only a few standard parts from warehouse stock*, M/P Metlwals permit fast, easy installation of permanent paneling . . . eliminate the need for any type of filler board, plaster, or other construction materials. And Metlwal is ideal for new construction, too.

Movable Partitions for Flexible Floor Plans

In outer offices, where efficient use of space may require floor plan changes, Metlwal movable partitions provide a durable, attractive means of dividing space . . . permanent, yet easily moved without waste of time or material.

Factory Finished in Crackproof, Chipproof Enamel

The face sheets of M/P Metlwals are factory finished in natural woodgrain reproductions or in a variety of baked enamel colors. These beautiful finishes will not crack, chip or craze . . . *do not reflect harsh metallic light.* Bonderized against rust and corrosion, Martin-Parry Metlwals meet every paneling and partitioning requirement and assure faster, cleaner, easier installation . . . combine long life, lasting beauty, soundproofing and fire resistance with low initial cost and easy maintenance.

Write today for FREE BOOKLET A10 for your A.I.A. file . . . showing how Metlwals can help you plan and utilize office space more effectively . . . how Metlwals are made and installed . . . along with specifications and photos of actual installations. ADDRESS: Martin-Parry Corporation, Fisher Building, Detroit 2, Michigan. PLANTS: Toledo, Ohio; York, Pa.

MARTIN PARRY MP PRODUCTS

METLWALS

ALL-FLUSH PANELING
MOVABLE PARTITIONS

67 Years of Service

ENGINEERING AND ERECTING SERVICE AND WAREHOUSE STOCKS FROM COAST-TO-COAST

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

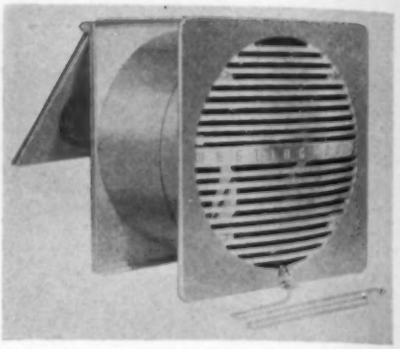
(*Continued from page 172*)

WATER SOFTENER

The *Waterqueen water softener unit* can be installed in the water service line to furnish filtered soft water throughout the house. The tank comes in five different models, depending upon hardness of the water to be treated. Floor space required is 12½ in. deep, 22 in. wide, and 54 or 66 in. high. In order for the unit to be used with private water system, there must be a pumping capacity of at least 250 gallons per hr. When water pressure is greater than 75 lb., a pressure regulator is installed ahead of the softener on the incoming water line. Waterqueen Water Softener Co., 228 State Tower Bldg., Syracuse, N. Y.

VENTILATING FAN

Designed primarily for installation in the wall of kitchen or home laundry, *Poweraire Home Ventilator* moves air at a rate of 350 cu. ft. per minute, enough to change the air in an average kitchen



Ventilating fan for kitchen or laundry

once every two minutes. When installed, the fan is concealed in the wall behind a slotted aluminum grille. It is equipped with an insulated outside door, closed by a strong spring. Unclipping a chain starts the fan and simultaneously opens the door. It operates on alternating current only. Westinghouse Electric Corp., 306 Fourth Ave., Box 1017, Pittsburgh 30.

ATTIC LOUVER

A new louver for attic wall installation is a flanged self-framing type for use in new construction. No wood frame or wood trim is required. Design features include a sloping surface at the top, a drip edge along the bottom, and absence of moisture-collecting pockets at the juncture of frame and sides. It is made in five sizes, of 26 gauge galvanized iron, prime-coated with aluminum paint. The Leslie Welding Co., 2943 West Carroll Ave., Chicago 12, Ill.

TELEVISION ANTENNAE

The owners of television sets in multi-story apartment houses often find that reception is marred by echo images resulting from waves reflected from steel frame buildings, and by the close proximity of receiving antennae. The *Intra-Video Master Television and FM System*, based on the invention of Dr. H. E. Kallman, is said to make possible trouble-free reception in apartment houses, and replace row on row of individual antennae. All signals from each transmitter are reportedly picked up by the Intra-Video system, cleaned up, individually amplified, and fed through a single coaxial cable for distribution (without interaction) to as many outlets as desired. Pickup of FM band is also included. It is claimed that all standard makes of television sets may be hooked onto the system without alteration. Telicon Corp., 851 Madison Ave., New York, N. Y.

RADIANT BASEBOARDS

Two new designs in radiant baseboard panels have been announced: one for fully radiant effect, and the other, a radiant-convector type. These panels replace the wood baseboard along one or

(*Continued on page 176*)

IMPLEMENT OF ARCHITECTURE

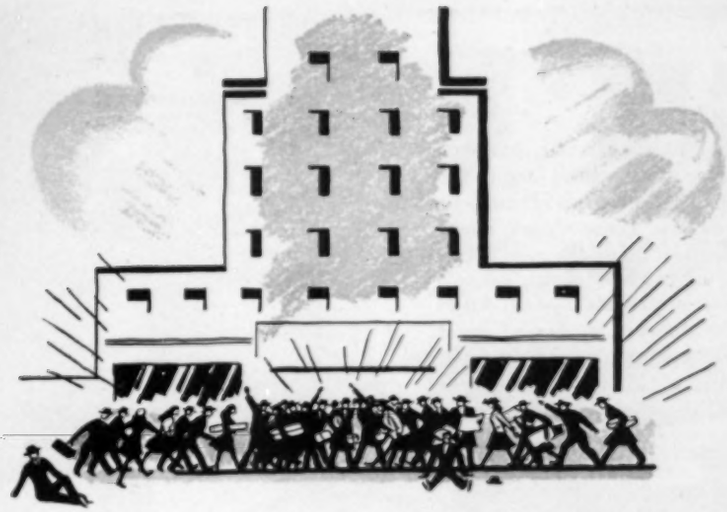
Actual specifications from Schlage Drawing #C-2315:

"Knob action must be smooth, free, and snappy.
Key action must be smooth, free, and definite.
Knob catch must engage freely and securely.
Check demountable knob feature with P-5126 instruction.
Check for proper hook-up with latch unit."

Such dependable action is assured by perfectly formed parts, manufactured to exacting dimensions.

SCHLAGE
LOCK COMPANY
SAN FRANCISCO • NEW YORK

ORIGINATORS OF THE CYLINDRICAL LOCK

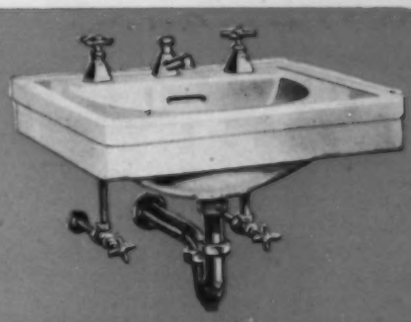


CROWDS AREN'T CONSIDERATE!

IN SCHOOLS, STORES, STADIUMS . . . places where public use is both constant and careless . . . Richmond plumbing and heating equipment is providing long, trouble-free service. That's why it is safer to specify Richmond for institutional, industrial and commercial buildings.

Richmond products provide a greater return for your client because their installation costs are lower. Well-packaged, with clear, accurate instructions, they save installation time.

Richmond plumbing equipment is backed by the one-year guarantees recommended by the U. S. Bureau of Standards. Richmond gas-fired heating equipment has both AGA approval and a one-year replacement guarantee. For details, write Richmond Radiator Co., 19 East 47th Street, New York 17, N. Y.



Morley Vitreous China Lavatory G-135. An attractive lavatory slab for either centerset or combination supply fitting. Rectangular bowl, rear outlet, integral open overflow and anti-splash rim. Sizes: 20" x 18" and 24" x 20".

SHIPPED COMPLETELY ASSEMBLED

Winter Air Conditioner: Four sizes: 66,000, 90,000, 115,000 and 140,000 btu input; heats, humidifies, circulates, filters; Baked-on white Dulux enamel finish; easily installed; occupies only appr. 4 to 6 sq. ft. floor space. Special cowl converts to floor-type heater.

FACTORIES AT METUCHEN, N. J., MONACA, PA., NEW CASTLE, DEL., UNIONTOWN, PA. (2)

RR

RICHMOND RADIATOR COMPANY

Affiliate Reynolds Metals Co.

Enameled Cast Iron Ware • Vitreous China • Perma-Gloss • Gas Boilers • Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 174*)

more sides of a room, installed flush or partially recessed. The design permits the addition of regular wood molding at top and bottom of the radiant panel. Made of smooth-finish cast iron, the panels may be painted to match walls or woodwork. Special valve enclosures and matching corner covers are furnished, so that all piping and valves will be readily accessible. American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Penn.

SCALE MODELS

A model-building service has been announced by a firm staffed largely with men who gained experience in constructing intricate Air Force target models during the war. Services range from miniatures of product design to complete architectural scale models. An example is the model of St. Ann's Church, St. Louis, ARCHITECTURAL RECORD, Sept. 1947, p. 102. Mitchell Models, 112 Water St., Benton Harbor, Mich.

New door closer features compact design

DOOR CLOSER

The new *Yale Compact Door Closer* was designed to eliminate bulkiness and reduce the size of operating arms. Among other announced features are fully controlled closing, two-speed adjustment, and noiseless operation. It is automatically self-reversing for either right or left-handed doors. The Yale & Towne Mfg. Co., Stamford, Conn.

CORROSION-RESISTANT PIPE

High-Silicon Iron

Duriron pipe, containing approximately 14½ per cent silicon, is said to be resistant to the attack of most corrosives and completely unaffected by acid wastes encountered in laboratories or chemical processes. Among manufactured items are the following: laboratory sinks, standing overflows, floor drains, traps, pipe and fittings in various shapes, a special pipe cutter, and rope packing. The Duriron Co., Inc., Dayton 1, Ohio.

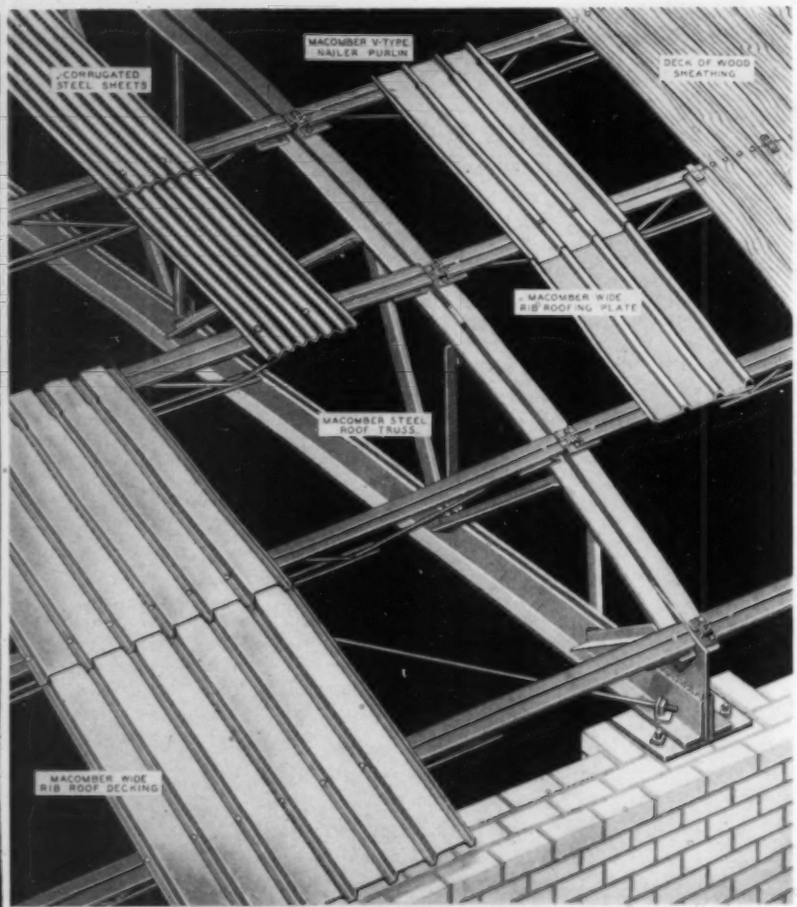
Plastic-Lined

Corrosion-resistant pipe and fittings are lined with *Saran*, a plastic which is said to offer great resistance to a wide range of chemicals, oils, and solvents. Main use is in the manufacture of chemicals, pulp, paper, and textiles, and in metal-treating and metal-plating processes. Maximum pipe length is 10 ft.; sizes are 1 in. to 4 in. Fittings, also Saran-lined, include elbows and tees, companion and reducing flanges, and gaskets. The Dow Chemical Co., Midland, Mich.

ALUMINUM ROOFING

Alcoa Industrial Roofing is specifically adapted to factories, warehouses, storage depots, hangars, and all types of open-framed buildings. This aluminum roofing material will have a covering width of 32 in., allowing for a side lap of 1½ corrugations; and will come in standard 5-ft. through 12-ft. lengths, .032 in. thick. Alcoa engineers state that the

(*Continued on page 178*)


MACOMBER V-TYPE NAILER PURLIN
CORRUGATED STEEL SHEETS
DECK OF WOOD SHEATHING
MACOMBER WIDE RIB ROOFING PLATE
MACOMBER STEEL ROOF TRUSS
MACOMBER WIDE RIB ROOF DECKING

PATENTS PENDING

For Better Structural Design –

For Fast, Economical Construction use . . .

Macomber All Steel V-Type Nailer Purlins. Shown above are various types of roof decking nailed directly to V Purlins. Specify them for short-cuts to occupancy from standard steel joist loading tables. This modern aid to building is also available in V-type Floor Joists and Studs. For further information write us.

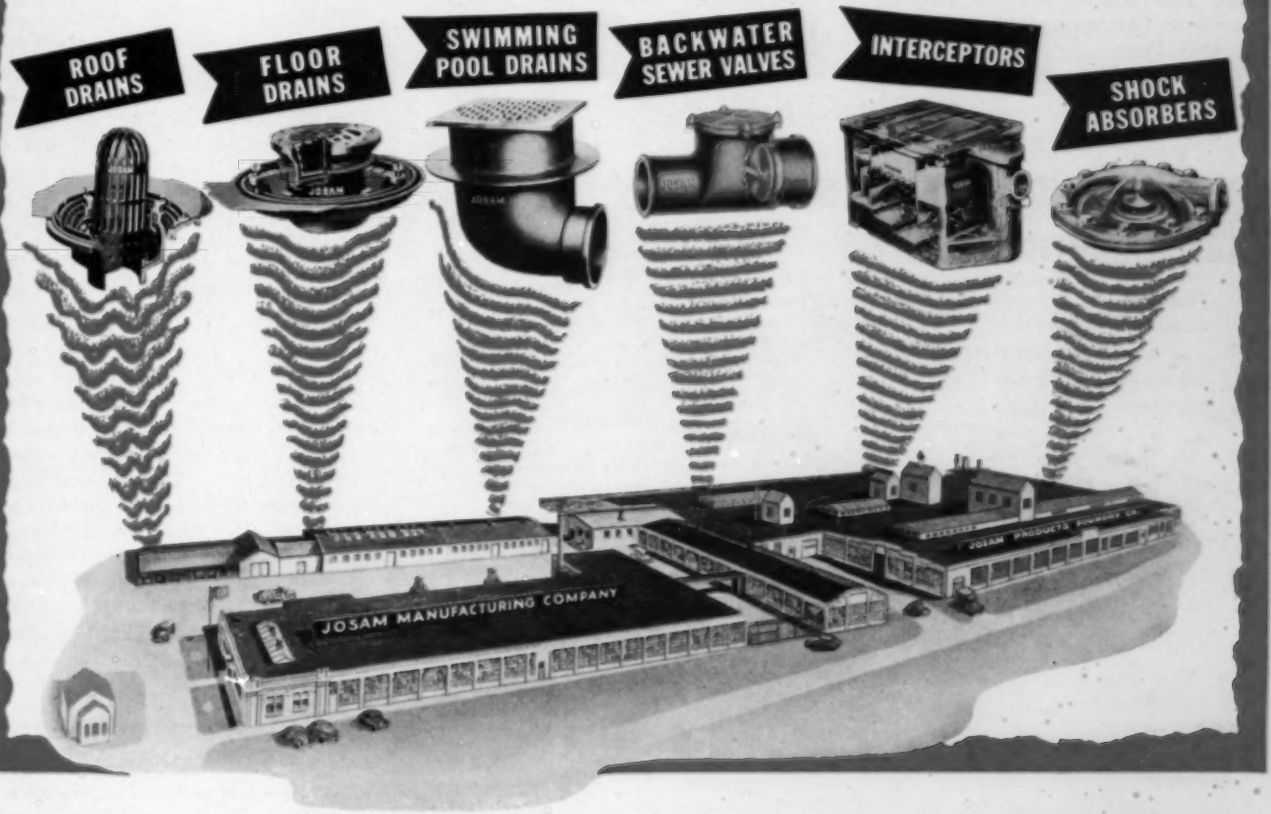
MACOMBER

CANTON • OHIO

MEMBER OF THE STEEL JOIST INSTITUTE

GUESS • HOW MANY PRODUCTS CAN • BE PRODUCED FOR YOU

with JOSAM'S NEW FACILITIES



Whether you use one drain or a thousand, the production facilities that make the drains are important to you. They mean the difference in doing the job they way you want it done . . . in having it completed on schedule . . . and in eliminating any "kick-back" after the job is completed. During the war years you were more than tolerant of delays . . . but you were looking to the day when you could get *what* you wanted *when* you wanted it. Josam was looking toward that day too, and developed newer and larger production facilities.

Now, after months of making additions to factory and foundry space and machinery, the Josam plants are really a marvel of mechanical production. Older, slower operations have been made completely automatic. New modern processes have resulted in many product improvements. Latest types of machinery are turning out Josam Products at an amazing rate.

You may never guess how many drainage products Josam's new facilities will be able to produce, but you can be assured that they can now turn out all that you will need. This ability to more than triple prewar production didn't happen suddenly . . . Josam's policy for almost thirty-five years has always been to keep ahead of plumbing drainage requirements by continuous improvement of both product and process. Today, the Josam line includes over a thousand different types of drainage products, making the right type of plumbing drainage product available to you for every purpose!

JOSAM MANUFACTURING COMPANY

Executive Offices:
304 Ferguson Building, Cleveland 14, Ohio

JOSAM-PACIFIC CO. 765 Folsom St., San Francisco, Cal.
West Coast Distributors

Josam
STANDARD OF THE WORLD

Manufacturing Division:
Michigan City, Indiana

EMPIRE BRASS CO., LTD., London, Ontario, Canada
Canadian Distributors

Representatives in all Principal Cities

See our Catalog in Sweets'. *Member of the Producer's Council*

THERE ARE NO SUBSTITUTES FOR JOSAM PRODUCTS

(Continued from page 176)

new product meets safe load requirements (using a safety factor of 2), ranging from a 30 lb. per sq. ft. uniformly distributed load on 6 ft. 5 in. purlins up to a 105 lb. load of 3 ft. 6 in. purlins. Industrial siding of the same alloy and lengths as the roofing is also in production. All necessary fittings and accessories, such as ridge roll, flashings, rivets, nails, and straps, will be supplied. Aluminum Company of America, Pittsburgh 19, Penn.

PANEL-HEATING VALVE

The *Radiantrol* combination balancing valve and air vent is designed especially for use with pipe coils in radiant panel-heating installations. It is similar to a butterfly-type valve and can be used with pipe coils buried as deep as 8 in. within the slab. The stem, which is cut to appropriate size, extends from the valve to the brass floor plate, which is marked to indicate open and closed position and operated by the foot. A slightly different type of valve for hand operation is located in a valve pit or in a cupboard off the floor. The valves are adaptable to both 1-in. and 1¼-in. pipe. A form for protecting the valve during concrete pouring is provided by its shipping container, especially designed for that purpose. Homestead Valve Mfg. Co., Inc., Coraopolis, Penn.

HOT WATER BOILERS

Two new and larger size models of *Hydrotherm* automatic gas-fired central heating plants have been announced. Said to be particularly suitable for use on convector and radiant heating systems, these new units are designed for the heating of large houses and for volume water heating for apartment houses, hotels, laundries, industrial and commercial buildings. Model No. 2-1/2HW3 is for 600 sq. ft. installed radiation; Model No. 2-1/2HW5 for 1000 sq. ft. Hook & Ackerman, Inc., 18 East 41st St., New York, N. Y.

SHOWER CABINETS

The new *Tiletone* line of shower cabinets is available in three types: the Utility Cabinet for basements, summer cottages, or wherever occasional shower facilities are needed, the Standard Cabinet for standard bathroom installations, and the Deluxe Fitted Cabinet which has a lighted interior, terrazzo receptor, and and adjustable spray shower head. Tiletone Co., 2323 Wayne Ave., Chicago 14, Ill.

ANTI-SCALE DEVICE FOR WATER HEATERS

The *McRay Treater* is reported to remove scale and prevent its formation in water heaters, and pipes fed by the tank. It consists of a number of zinc and copper plates which control electrolysis and thereby render water salts and minerals inert when suspended in the water at the hot water outlet. The regular size for household use has a handling capacity of 300 gallons of water per day. Larger types are available. McRay Sales Co., Dept. AR, 1156 East Colorado St., Pasadena 1, Calif.

PLASTIC TARPAULIN

Semi-transparent *Celanese Vimlite* is offered as a means of winterizing new construction without shutting out sunlight when used as a weather shield. Supplied in rolls 36 in. and 28 in. wide, it can be tacked or stapled to light framing or joined to produce any desired width or length. After use, Vimlite can be rolled and stored like ordinary tarpaulin. Two types are made: plastic-coated wire mesh and plastic-coated plastic mesh. Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.

(Continued on page 180)

THIS TELLS YOU HOW TO GIVE SAFE EXIT TO CORROSIVES

This new, 12-page bulletin tells you how, why and where you should use Duriron acid-proof drain equipment for corrosive wastes.

The booklet first tells you about Duriron; its composition, advantages, physical properties and corrosion-resisting ability. This high-silicon iron is compared with other materials and its superiority for handling corrosives is shown in dramatic visual form.

A handbook on Duriron drain line material for handling corrosive wastes, the bulletin gives engineering data, sizes, dimensions and drawings of the various pieces of Duriron equipment . . . instructions on how to install . . . information on application in chemical laboratories, industrial installations, engraving plants and other places where corrosives are handled. Installation photos and a partial list of existing installations in various types of plants are also included.

Today's high cost of repairs makes the Duriron drain line installation even more economical than ever.

Find out how you can protect your waste disposal system against costly corrosion. Write for this new, free bulletin today. Ask for Bulletin 703.

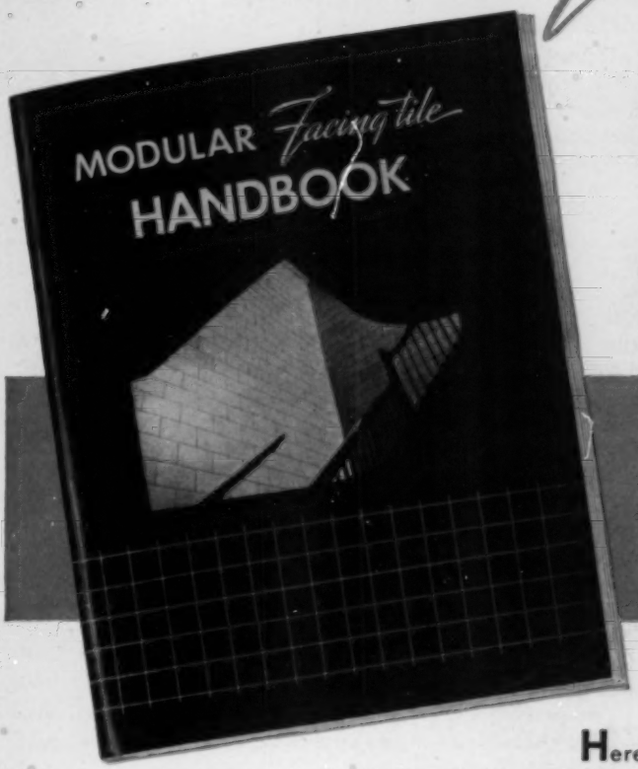
THE DURIRON CO., INC. • DAYTON 1, OHIO

Branch Offices in Principal Cities

DURIRON
ACID PROOF
DRAIN PIPE

48-CM

NEW—MODULAR *Facing tile* HANDBOOK



FREE—TO REGISTERED ARCHITECTS AND ENGINEERS

AVAILABLE—TO ALL OTHERS FOR FIFTY CENTS

THIS 90-PAGE HANDBOOK IS THE FACING TILE INSTITUTE'S PRESENTATION OF MODULAR FACING TILE TO THE ARCHITECTURAL PROFESSION

Here is a handbook of great value to architects, engineers, builders, masonry contractors and others interested in using Structural Clay Facing Tile in modern design and construction.

Standard modular sizes are now available for Structural Facing Tile. As a ready source of information on Modular Facing Tile, the Facing Tile Handbook presents in three sections: (1) specifications, available colors, fire resistive ratings (2) detailed illustrations of various sizes and shapes (3) suggested assembly details and layout procedures.

With modular coordination of building materials and equipment becoming increasingly important, you should find frequent use for this up-to-the-minute information. Send for your copy—NOW.

Registered architects and engineers may get a FREE copy by filling out and mailing the attached coupon pinned to their letterhead. All others send the coupon and 50 cents.

FACING TILE INSTITUTE

1756 K Street, N. W. Washington 6, D. C.

SEND THIS COUPON FOR YOUR COPY TODAY

FACING TILE INSTITUTE, Dept. AR-10
1756 K Street, N.W., Washington 6, D.C.

GENTLEMEN:

Please send me your new MODULAR FACING TILE HANDBOOK
I enclose 50 cents with this coupon. ☐

NAME PROFESSION

STREET CITY STATE

Hillyard Non-skid Floor Treatments, and Economy Maintenance Materials properly care for and make attractive all types of floors in every type of institution . . . give entire satisfaction with less labor. Write for our new "Job Specification" Booklet, it is sent FREE upon request.

HILLYARD SALES CO's

DISTRIBUTORS

HILLYARD CHEMICAL CO. ST. JOSEPH, MO.

470 Alabama St., San Francisco, Calif. 1947 Broadway, New York 23, N. Y.

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 178*)

GERMICIDAL REFLECTORS

Added to the line of Silv-A-King lighting reflectors is a new germicidal unit which is offered as a means of protection against airborne bacteria in homes, schools, factories, and offices. The units are designed for use with standard germicidal lamps. Installation data gives number of units and mounting heights for rooms of different sizes and ceiling height. The reflectors are either mounted on the walls above sight level or hung from the ceiling so that rooms occupants will not be exposed to direct radiation. Bright Light Reflector Co., Bridgeport, Conn.

ALUMINUM AWNING

The *Lifetime aluminum awning* is of Venetian-type aluminum construction, made in standard units for houses and commercial buildings. Inside fingertip control governs amount of shade and ventilation. Finish is in a choice of baked enamel colors. J. E. Baker Co., 1325 E. 152nd St., East Cleveland 12, Ohio.

ROOFING NAIL

A new type of roofing nail has a *Neoprene* washer which forms a seal between the nail head and the aluminum or other metal sheeting and roofing. Neoprene, developed by Du Pont, is a form of rubber that reportedly will not grow soft in hot weather or brittle in cold. Two companies are now manufacturing aluminum nails complete with these washers: Nichols Wire & Steel Co., Davenport, Iowa; and Independent Nail & Packing Co., Bridgewater, Mass.

QUONSETS

Quonsets are now available in a new 36-ft. width, to meet demands from rural areas where 36 ft. is the recommended standard for certain farm structures, and from cities where 40-ft. lot frontages are common. The basic *Quonset-36* unit is 20 ft. long: buildings may be any multiple of that length. Production of Quonsets in 20-, 24-, and 40-ft. widths, and wider multi-arches, will continue. Stran-Steel Div., Great Lakes Steel Corp., Penobscot Bldg., Detroit, Mich.

DRAFTING STOOL

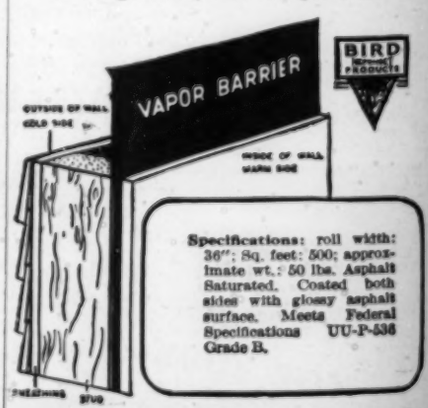
A drafting stool of welded tubular construction with spring-filled leather or leatherette seat can be adjusted in height from 22 to 28 in. or 27 to 33 in. Metal portions of the stool are finished in taupe-color oven-baked enamel. Royal Metal Mfg. Co., 175 N. Michigan Ave., Chicago 1, Ill.

(*Continued on page 182*)

VAPOR Condensation Lots of Fun on Windows

Lots of Trouble Within Walls

Harmless on windows, moisture condensation plays havoc within walls. Uncontrolled condensation can make insulation soggy and inefficient, cause paint peeling, wall stains — even structure rot. A sure way to prevent these costly evils is with a separate vapor barrier. Architects everywhere specify the standard — Bird Neponset Black Vapor Barrier. Applied on the warm side of insulation, Bird Neponset Black repels vapor, keeps insulation at peak efficiency, ends other condensation evils. Only about $20 buys life-long protection for a $10,000 building. See Sweet's Architectural file, 9b-2. For sample, write Bird & Son, inc., 178 Washington St., East Walpole, Mass.



Specifications: roll width: 36"; Sq. feet: 500; approximate wt.: 50 lbs. Asphalt Saturated. Coated both sides with glossy asphalt surface. Meets Federal Specifications UU-P-536 Grade B.

BIRD NEPONSET BLACK VAPOR BARRIER

BIRD & SON, inc., E. WALPOLE, MASS.

CHICAGO NEW YORK SHREVEPORT

LIGHT *with*

DISTINCTION
.....COMFORT
.....UTILITY

Pittsburgh Permaflector Fluorescent and Incandescent Standard Units make it easy to achieve the illumination you require without costly special-made equipment.

Custom effects of infinite variety and superior performance can be easily obtained with Permaflector Planned Lighting.

Get the details now on how you can gain these more effective and efficient illuminating results by using Pittsburgh Permaflector Equipment.

A PERMAFLECTOR PORTRAIT
Joseph Magnin — Sacramento, Calif.
Designed by: Gruen & Krummeck — Associates
Luppen & Howley — Elec. Contractors

"Pittsburgh" Permaflector

PITTSBURGH REFLECTOR COMPANY

OLIVER BUILDING • PITTSBURGH 22, PENNSYLVANIA

MANUFACTURERS OF FLUORESCENT AND INCANDESCENT LIGHTING EQUIPMENT
DISTRIBUTED BY BETTER ELECTRICAL WHOLESALERS EVERYWHERE

Permaflector Lighting Engineers in All Principal Cities

ODDS 3 to 1

that your plans place the kitchen range on an

INSIDE wall

Blo-Fan electric *ceiling* ventilator builds in between the ceiling joists *directly over the kitchen range*—where a fan belongs.

Blo-Fan ducts out smoke, odors and grease-laden air . . . *as they rise . . . before they spread.*

Blo-Fan patented blade provides the *volume* of a propeller with the *power* of a blower.

Blo-Fan is nationally distributed by more than 450 franchised wholesalers covering every city in the country. See Sweets, or write for complete information.

Blo-Fan

ELECTRIC CEILING VENTILATION

MORE THAN A FAN
MORE THAN A BLOWER

PRYNE & CO., INC.
LOS ANGELES 54, CALIFORNIA
NEW YORK CHICAGO

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 180*)

HINGE FOR GLASS DOORS

A special *Pittco checking floor hinge* has been developed for use with heavy all-glass doors. Among its engineering features are graduated pressure areas in the normal 90° opening arc. The first 15° has the greatest spring load to prevent opening from wind pressure. The next 45°, arc of the greatest use, has a materially reduced spring load, while in the last 30°, the spring load gradually builds up to give a snubbing action. At 90°, there is a hold-open position. The hinge is furnished with a cement case, top pivot assembly, and arm with shim plate for attachment to the door. Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Penn.

SINK FRAME

The *Hudee sink frame* comes in a wide range of sizes to fit all standard flat rim metal sink bowls with rounded outside corners; designed for fast water-tight installation either before or after cabinet top material is applied. The frame is furnished with a set of lugs and screws with which the frame and sink bowl are secured to the cabinet top, and four temporary clips to hold the bowl in place while lugs are being attached. Sink hangers and rabbeting are eliminated. Walter E. Selck & Co., 223 W. Hubbard St., Chicago 10, Ill.

ALUMINUM WINDOWS

A new line of aluminum windows for houses include both casement and awning types. Joints are electrically flash-welded and hardware is aluminum throughout, with stainless steel pins for the hinges. "Roto-controls" permit operation of both types of windows from the inside. Aluminum screens and storm windows can be furnished. Ware Laboratories, Inc., 21 West St., New York, N. Y.

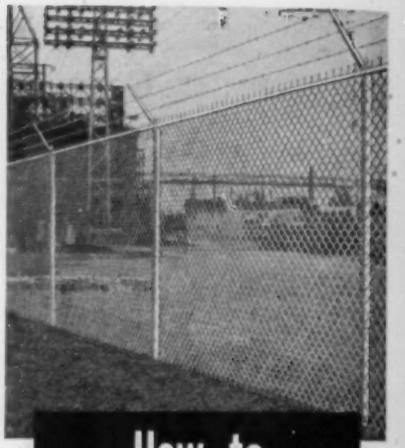
PLYWOOD FINISHER

Firzite, manufactured in clear and pigmented white grades, is used to prepare surfaces of fir plywood for painting and finishing. Its application is reported to minimize "wild" grain in finished surfaces and checking under painted work. U. S. Plywood Corp., 55 West 44th St., New York 18, N. Y.

TOILET SEAT

A newly designed seat and cover for toilets has a self-sustaining hinge that exerts a gripping action to prevent slamming shut. Seat and cover are made of solid plastic. Sperzel Co., 911 Henn Ave., Minneapolis, Minn.

(*Continued on page 184*)



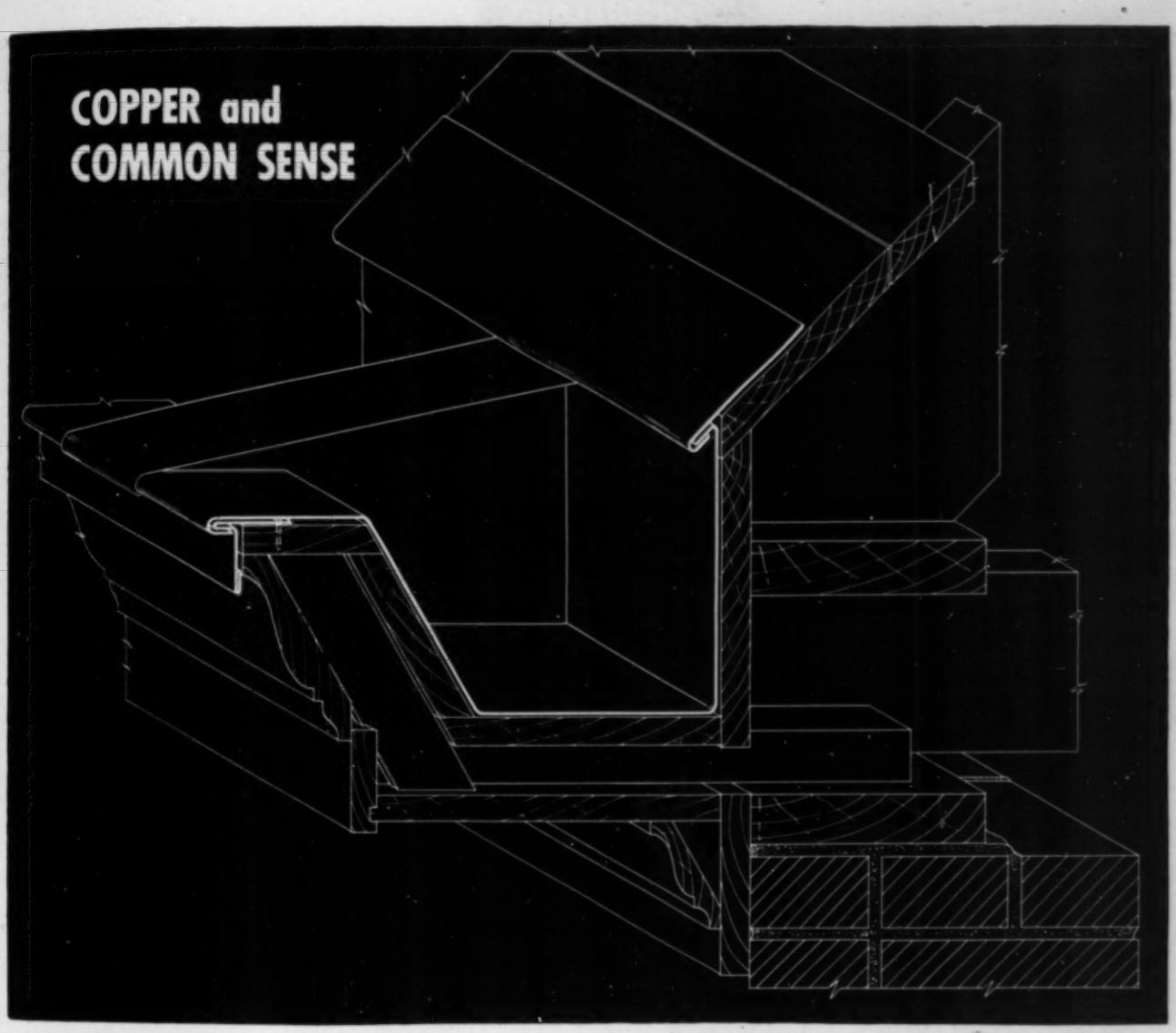
How to SPECIFY FENCE that gives LONGER LASTING PROTECTION

1. *Consider these four exclusive features of Anchor Chain Link Fence* which mean all-out protection during long years of service for your clients. *Deep-Driven Anchors*, which hold the fence erect and in line, in any soil or weather, yet permit easy relocation where necessary. *Square Frame Gates*, amazingly free from warping and sagging. *U-Bar Line Posts*, self-draining, rust-free and rigid. *Square Terminal Posts*, which improve strength, durability and appearance.

2. *Send for your free copy of our book, "Anchor Protective Fences,"* for your A. I. A. File 14-K. It's both a catalog and specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables. Just ask for Book No. 110. Address: ANCHOR POST FENCE DIV., Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Maryland.

Anchor Fence

Nation-wide Sales and Erecting Service



QUESTION: What is the best way to determine locations of expansion joints in sheet copper construction?

ANSWER: Use the chart on page 28 in Revere's Manual of Sheet Copper Construction*

A CHART which makes it easy for you to determine the correct gauge copper for any gutter lining as well as the maximum distance that may safely be used between an expansion joint and a fixed point is one of the important results of Revere's extensive sheet copper research program. This chart and simple instructions for using it are on pages 28-29 in Revere's 96-page manual of sheet copper construction.*

This booklet is filled with new facts which enable you to design or install gutter linings, flashings and roofs that give *extra* years of service. It is complete with charts, illustrations and detailed information so arranged that you can read and apply final figures that insure the finest sheet copper construction.

This book has been widely distributed to architects and sheet metal contractors, and in all probability it is in your office files. Be sure to refer to it. If you do not have a copy, write for one now on your office letterhead.

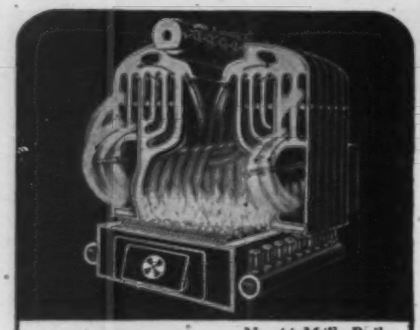
For further information or assistance with the design or installation of sheet copper, the Revere Technical Advisory Service, Architectural, will be glad to help you.

*"*Research Solves Problems of Stress Failures in Sheet Copper Construction."*

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, New York
Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.



No. 44 Mills Boiler

"There's a long, long trail . . ."

The hot flue gases in an H. B. Smith Cast-Iron Boiler rise directly to the highest surface of the boiler, across to each side, to the front through the upper flue passages, then to the back through lower channels, and finally up the chimney. It's really a long, long trail . . . and not a straight one.

Actually, the gases would rather rush directly to the chimney, but the efficient "Mills" design hinders them at every turn. Instead, they're scientifically-directed along paths which give them a chance to scrub against maximum heating surface and give up more heat.

That's the secret of Smith-Mills efficiency. The result is more heat per fuel unit . . . less fuel used . . . lower fuel costs.

It *pays* to specify H. B. Smith boilers for industrial, commercial, institutional and residential jobs. If you want to know more important H. B. Smith advantages, send for your free catalog.

H.B. Smith

CAST IRON BOILERS

THE H. B. SMITH CO., INC.,

67 Main St., Westfield, Mass.

Offices and Representatives in Principal Cities

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 182*)

CHURCH BELL AMPLIFIER

When installed on a church bell, just below the point where the clapper strikes, a General Electric magnetic device is said to capture the inaudible vibrations of bell tones. The magnet helps produce a greater electrical impulse when the sound is picked up by an amplifier system. Liberty Carillons, Inc., 551 Fifth Ave., New York, N. Y.

BRONZED CAST IRON

A technique has been developed for giving a two-tone bronze effect to cast iron decorative building fronts. The finishing process consists of stripping the metal clean, treating the surface with special bronze metallic powder, spraying on pigmented material, and relieving highlights. Stuart-Dean, Inc., 126 West 54th St., New York, N. Y.

TRACING SCREENS

When a special colorless chemical is applied to *Craftint Doubletone Tracing Vellum* it brings out a hidden screen to serve as cross hatching or shading. Two types of vellum are available: regular, for tracings that are to be reproduced by contact print, blueprinting, ozalid, or similar methods; and O.S., for photographing and reproduction by offset, rotogravure, or letterpress printing. Craftint Mfg. Co., E. 152nd St. at Collamer Ave., Cleveland 10, Ohio.

STANDARDS

American Standards

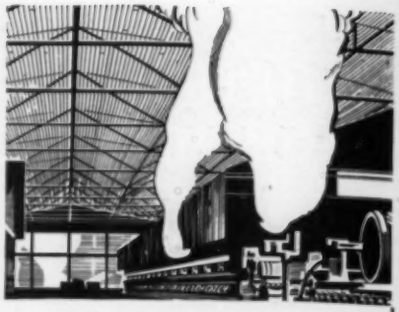
An entire new listing of 874 American Standards contains additional revised standards approved since the Jan. 1947 edition, and a revised price list. The listing may be obtained from American Standards Association, 70 East 45th St., New York 17, N. Y.

Douglas Fir Plywood

A revised commercial standard, CS45–47, on "Douglas Fir Plywood" is now in effect for new production. Rules cover five grades of exterior type plywood. National Bureau of Standards, U. S. Dept. of Commerce, Washington, D. C.

CORRECTION

In the August 1947 issue, under "Products for Better Building," the names of two manufacturers were quoted incorrectly. Correct name for the manufacturer of *Dubl-Coverage Tite-On* asphalt shingles is The Ruberoid Co., 500 Fifth Ave., New York; for the manufacturer of *Amtico* rubber tile flooring, American Tile and Rubber Co., Trenton, N. J.



This Wood Changed Buying Habits of an Industry

PULP AND PAPER MILLS have a hard time finding construction materials that can withstand their high temperatures and humidities. For example, before the lasting ability of Wolmanized Lumber* was so generally known, they were continually having to replace ordinary wood that had decayed within three or four years.

THEN THEY STARTED to use Wolmanized Lumber for roof planks and timbers, window frames and sash, and elsewhere in the mills. Because this wood is highly resistant to decay and termite attack, the need for replacements in mills using it practically disappeared.

LOWER MAINTENANCE costs result when Wolmanized Lumber is used; service records covering millions of feet, some in use over twenty years, are evidence of this fact. In addition, all of the advantages of wood construction are retained: ease and speed of erection, light weight, resilience, strength, high insulating value, and low first cost.

WOLMANIZED LUMBER is ordinary wood, made long-lived by vacuum-pressure impregnation with Wolman Salts* preservative. It is clean, odorless, and paintable. May we send you more information? Write American Lumber & Treating Company, 1679 McCormick Bldg., Chicago, Ill.

*Registered Trade Marks

Wolmanized **LUMBER**

WOLMANIZED A·L·T AMERICAN LUMBER & TREATING CO.

FIRST point of SAFETY . . .

SAFETY—now stressed in public buildings as never before—begins with the door, most used part of any building. For either remodeling or new construction, an International Van Kannel revolving door is the most efficient entrance you can buy. Under normal conditions it provides automatic traffic control. In emergencies, or whenever excess pressure is applied, an exclusive panic-action mechanism allows the wings to swing free, thus permitting as much free exit space as any two standard doorway widths. In most models an added feature allows the collapsed wings to be rolled completely out of the way quickly and easily.

For safety, plus other advantages outlined below, revolving doors by International are unequalled. Your inquiry will bring detailed literature and a list of nearby installations so you can see firsthand how completely a revolving door will solve your entrance problems, no matter how tough.

REVOLVING
INTERNATIONAL VAN KANNEL
DOORS

When Considering Doors, Ask These Questions About Revolving Doors

1. WHAT SPECIAL SAFETY FEATURES SHOULD THEY HAVE? First, immediate and unimpeded egress in emergencies. With International Van Kannel Revolving Doors, slight excess pressure on any two wings in opposite directions causes the wings to open outward. International's exclusive, adjustable tension, ball-and-socket mechanism assures years of dependable service with a minimum of upkeep.

2. HOW ABOUT HEATING AND COOLING COSTS? International Van Kannel Revolving Doors provide savings in heating and cooling up to 25% . . . in many instances more.

3. WILL REVOLVING DOORS INCREASE OR DECREASE USABLE FLOOR SPACE? International Van Kannel Revolving Doors, by eliminating drafts and controlling warm air loss, allow counters and work areas right up to the door itself, thereby materially increasing "pay" space in the building.

4. CAN THEY HANDLE DAILY TRAFFIC EFFICIENTLY? Elimination of cross traffic reduces confusion, speeds up crowd handling. Revolving Doors by International can handle up to 2880 passages per hour smoothly and safely . . . with surprisingly small air-loss.

5. HOW ABOUT DUST, DRAFTS, NOISE, ESPECIALLY IN HIGH WINDS? Tall buildings are like chimneys. Suction drafts (up to 60 m.p.h.) make swing door operation almost impossible. Revolving Doors are balanced. High winds do not affect their efficient air-seal, which keeps out dust and disagreeable outside noise.

6. HOW ABOUT COST? First cost of International Van Kannel Revolving Doors is actually less than swing door entrances of comparable traffic capacity . . . and they are far superior in economy of maintenance and length of service.

FOR COMPLETE INFORMATION, WRITE INTERNATIONAL STEEL CO., REVOLVING DOOR DIVISION, 1530 EDGAR ST., EVANSVILLE 7, IND.

Problem Solved with Webster-Nesbitt Unit Heaters

Webster-Nesbitt Little Giant Down-Blow Unit Heater

In 1944, Schutte & Koerting Co., manufacturing engineers for the power and process industries, sought a means to eliminate shortcomings in the heating of their Cornwells Heights, Pa., plant.

High ceilings with skylights and a long narrow manufacturing bay with large windows on both sides, had caused difficulties, discomfort for the men and lost time due to colds.

After study, a decision was reached to install Webster-Nesbitt Little Giant Down-Blow Unit Heaters above the crane runways and approximately 40 feet above the ground. Care was taken to determine the proper size, spacing and discharge velocity of these units.

After more than two heating seasons of operation, here are the results according to Winfield Beals, plant superintendent:

The heated air leaves the unit heaters at high velocity, diminishing at the working level so that the air spreads out to provide comfort in the working zone. The units are placed so that the effective heat circles overlap each other.

If you are experiencing difficulty in heating your plant, perhaps an engineered application of Webster-Nesbitt Unit Heaters and related Webster Equipment may provide a solution.

WARREN WEBSTER & CO., Camden, N. J.
Representatives in principal U. S. Cities : : Est. 1888
In Canada, Darling Brothers, Limited, Montreal

Webster
HEATING SYSTEMS

(Continued from page 164)

ing the installation of split rings and sheer plates for wide-span roof trusses and other heavy structures; toothed rings for light structures built in place; trussed rafters framed with Teco connectors; and framing anchors for framing rough openings. 12 pp., illus. Timber Engineering Co., 1319 Eighteenth St., N. W., Washington, D. C.

VENTILATOR

Breidert Air-X-Hauster. Description of aerodynamic principles of a stationary ventilator without fans, for roof or chimney top installation, reported to operate efficiently in any wind direction without down-drafts or air stagnation; engineer's report of tests at different wind directions and velocities. 8 pp., illus. G. C. Breidert Co., 3129 San Fernando Rd., Los Angeles 41, Calif.

WOOD SHEATHING

Sheathing and Bracing in Frame Construction. Blueprints detailing three forms of wall framing: stud walls without bracing but with diagonal sheathing, stud walls with let-in bracing and horizontal sheathing, and stud walls with cut-in bracing and horizontal sheathing. Given on blueprints are relative stiffness and strength factors of the three types of construction as compared with basic stud wall with horizontal sheathing and no bracing. West Coast Lumbermen's Association, 1410 S. W. Morrison St., Portland 5, Ore.

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Martin L. Beck, A.I.A., 10 Nassau St., Princeton, N. J.

Ch'eng Ch'eng Co., Architects and Engineers, 1 Nnghai Rd., Nanking, China.

Albert Criz, Architect, 556 S. Harvard Blvd., Los Angeles 5, Calif.

Harry W. Gjelsteen, Architect, 230 Sheridan Rd., Menominee, Mich.

William H. MacKay, Architect, 30 Colony St., Meriden, Conn.

Miami Builders' Exchange, c/o George J. Haas Co., 702 Olympia Bldg., Miami 32, Fla.

V. Nişanyan, Architect-Engineer, Osmanbey, Halaskâr Gazi cad. 202/2, Istanbul, Turkey.

E. G. Roberts, Engineer, 157 N. Illinois, Indianapolis, Ind.

James Berkeley Robinson, Architect, P.O. Box 234, Staunton, Va.

Alexander Zamshnick, Architect, 6 E. 46th St., New York 17, N. Y.

Show the housewife how easy it is to keep her whole house clean and fresh with a Trade-Wind Clipper Blower installed in her kitchen!

The Clipper is a complete, packaged ventilator which is easily, quickly installed. It is mounted in the ceiling between joists and vented outside—it traps and expels unwanted heat and odors the instant they rise. Unlike any other equipment, the motor in the Clipper is entirely removed from the air stream—away from all contaminated air. This means greater efficiency, longer life and easier servicing.

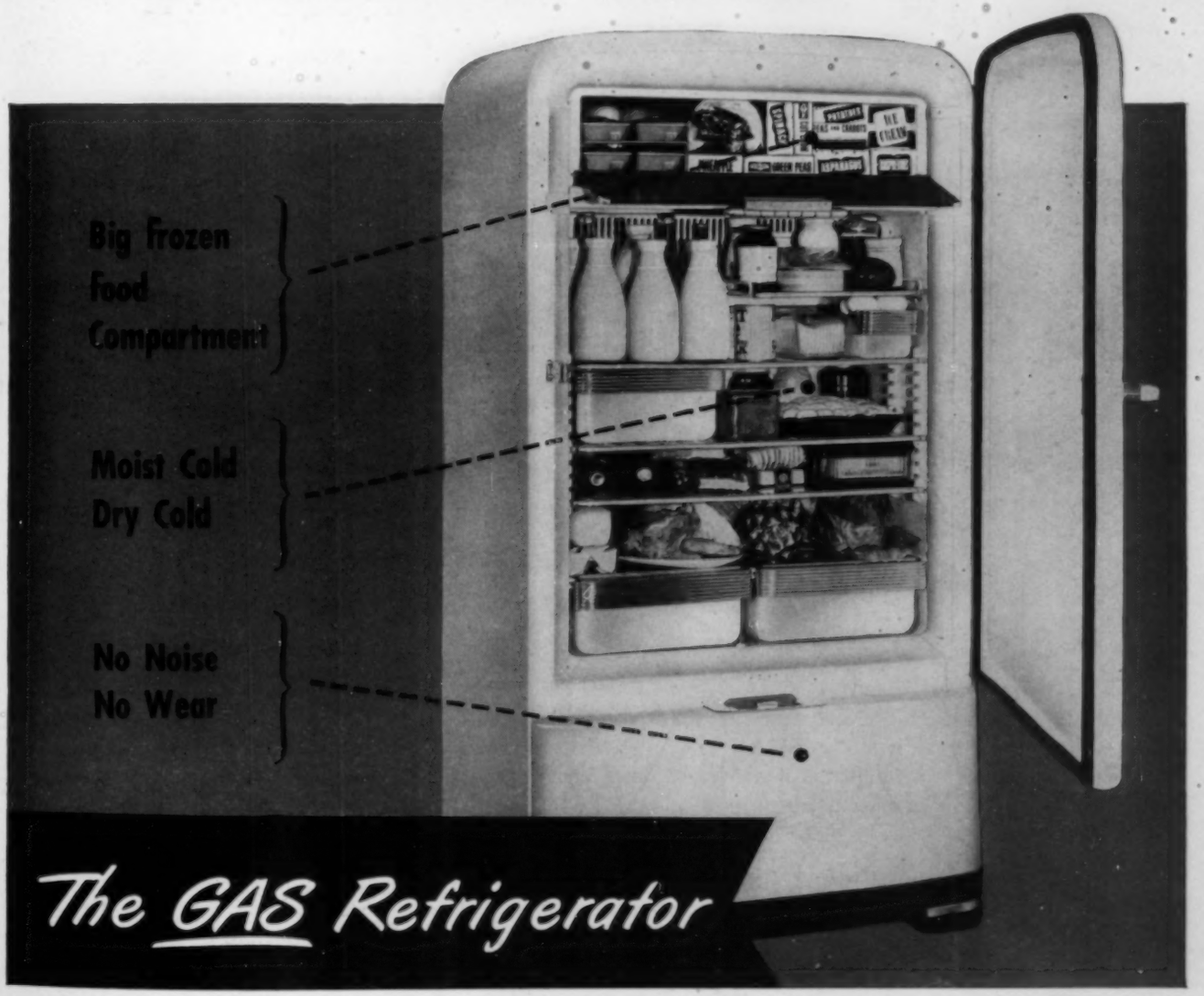
Effective in any small room—in old or new homes. Clipper Blowers are now carried in stock by electric supply dealers from coast to coast. Write us for the name of your nearest dealer and for the special bulletin which explains how simply the Trade-Wind Clipper Blower can be installed in old as well as new houses.

TRADE-WIND MOTORFANS, INC.
5707 SO. MAIN ST., LOS ANGELES 37, CALIF.

GAS REFRIGERATOR WITH NO MOVING PARTS

● You've heard many times that the Servel Gas Refrigerator has a simpler, basically different method of operation. Now you can *see* why Servel is different . . . why Servel can operate without making a sound and freeze without using a single moving part. The chart on the left tells the story.

Servel doesn't *need* a motor . . . pistons, pumps, valves, and compressors have no place in the Gas Refrigerator. There's nothing in the freezing system to make annoying sounds like the humming and clicking so prevalent among mechanical refrigerators. A tiny gas flame does all the work.

Today—amid the many noises of this modern mechanical world—people are seeking silence . . . especially for their homes. When the housing shortage becomes less acute, many prospective tenants and buyers will ask for homes that are noise-free. That's why more architects and builders are specifying Servel when they order new refrigerators.

There's another reason, too. Users profit from Servel's long life and year-after-year operation economy. And *you* profit from its lasting dependability and low overhead costs. Repair and replacement bills remain exceptionally low. For complete information, consult Sweet's catalog . . . or write to Servel, Inc., Evansville 20, Indiana.